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BIOLOGICAL SCIENCES

THE CURRENT STATUS OF YEREVAN'S GREEN SPACES AND TREATMENT PARTICULARITIES

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Abstract
The development and maintenance of urban green spaces play a crucial role in maintaining ecological balance, enhancing climate resilience, and promoting public well-being in modern cities. This study presents a comprehensive analysis of the dynamics of green space development in Yerevan, Armenia, from 2022 to 2024, with a focus on both quantitative expansion and qualitative improvements. Using secondary data analysis, elevation-based district comparisons, and climate records, the study evaluates the state of green areas across 12 administrative districts. The findings reveal uneven distribution patterns, with Nor Nork and Malatia-Sebastia districts showing the highest indicators in terms of area and recreational units, while Erebuni and Nubarashen districts lag. The research highlights the growing importance of drought-tolerant and ornamental tree species, along with the implementation of agro-technical measures such as seasonal fertilization, improved irrigation systems, and disease prevention strategies. Additionally, the results indicate a strong correlation between green space vitality and both climatic conditions and the efficiency of maintenance systems. The study concludes with targeted recommendations for enhancing the sustainability, accessibility, and ecological function of Yerevan's urban green infrastructure.

Keywords: urban green spaces, urban ecology, landscape, treatment, agro-treatment

Introduction

Urban greening and the effective care of green plantations, as well as the rational management of urban landscapes, are key elements ensuring the ecological, health, and social sustainability of modern cities. The preservation and expansion of green spaces at the local level contribute to a healthy lifestyle of the population, contribute to environmental sustainability, and at the same time mitigate global ecological challenges such as climate change, land degradation, and desertification. They also perform an important social function, acting as environments for recreation, interaction, and social communication, contributing to the improvement of the quality of urban life [11, 19, 24].

Yerevan, being the capital and one of the largest settlements of the Republic of Armenia, has been subjected to intense urban development pressure for years, which often leads to the reduction of green spaces. In some urban development projects, the greening component is underestimated or absent, as a result of which green spaces are perceived as a secondary or "sacrificed" resource in favor of construction activities [8,11].

It is undeniable that nature and urban development in Yerevan have a historically formed interaction, starting from the ancient Erebuni Hills to modern city parks and gardens. This connection is still relevant today, but faces new challenges related to both population growth and the prevailing trends of spatial development.

Yerevan is located in the central part of the Republic of Armenia, occupying the lowland and foothill parts of the Ararat Valley. The natural landscapes are semi-desert and dry steppe zones, which coincide with the subtropical dry land climatic type. Brown, weakly structured, pulverized mechanical composition, poor in nutrients, soils are characteristic. The relief of the city is complex, with a significant difference in altitude: for example, the Kentron administrative district is located at an altitude of about 1000 m above sea level, and Nor Nork is about 1300 m (**Figure 1**). The average annual precipitation is 250–350 mm. These conditions significantly complicate the process of landscaping and require developed agrotechnical care.

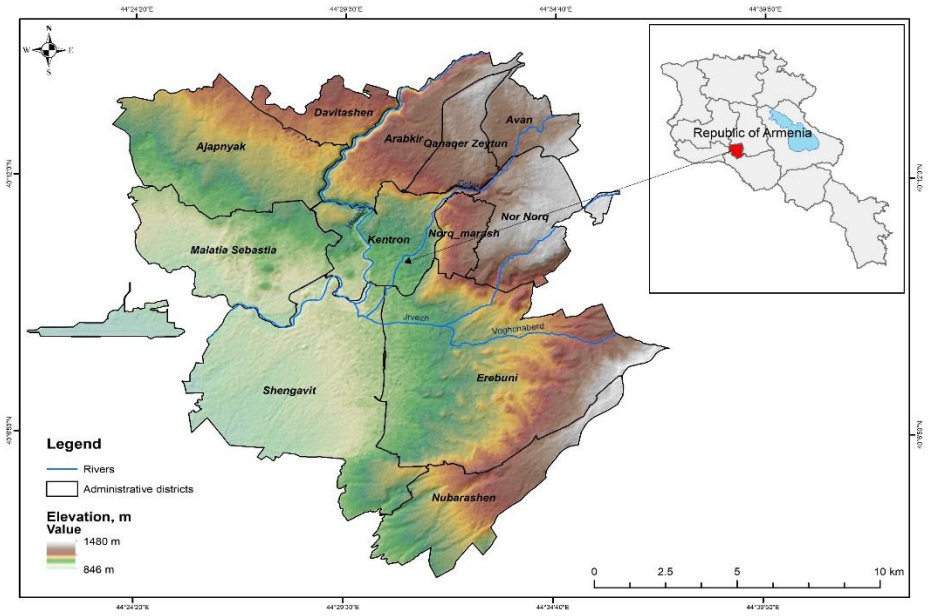

Fig. 1 The geographic location and topography pf Yerevan city

The object of this article is the current state of green plantations in Yerevan, highlighting the quantitative and qualitative changes in the areas over the past years. The goal is to assess the effectiveness of the treatment system, especially in the context of agro-measures aimed at fertilizing, irrigating, and stimulating the growth of newly planted trees, taking into account the climatic particularities of Yerevan.

Similar scientific works dedicated to the study of green areas can serve as a basis for improving Yerevan's greening strategy and creating a sustainable and healthy urban environment [1,22, 25].

Materials and methods

Monitoring the condition of green plantings is of great importance in the process of organizing the maintenance and care of urban green spaces. Through monitoring, it is possible to assess the functional condition of plantings, compare it with established standards and data from previous periods to identify the dynamics of changes. Practical work was carried out during 2022-2025 (first quarter of 2025).

Within the framework of this study, the quantitative and qualitative changes in Yerevan's green spaces over the past three years were analyzed using secondary data analysis and comparative analysis methods. Quantitative data were obtained from the official reports 2022, published by the Yerevan Municipality's "Greening and Environmental Protection" agency (**Figure 2**). A comparative analysis was also conducted based on the data, the aim of which was to identify changes in the state of green spaces in different years and between administrative districts.

The complex climatic conditions of Yerevan, including low precipitation and high thermal background, have a significant impact on the vitality of green spaces. Annual data from the RA Hydrometeorological and Monitoring Center were used to assess climatic factors, including information on precipitation and air temperature fluctuations. The analysis also included a comparative assessment between administrative districts based on the quantitative indicators of green spaces, species composition, and the level of organization of the treatment system. This approach allowed us to identify differences in the effectiveness of care systems and formulate recommendations for their improvement.

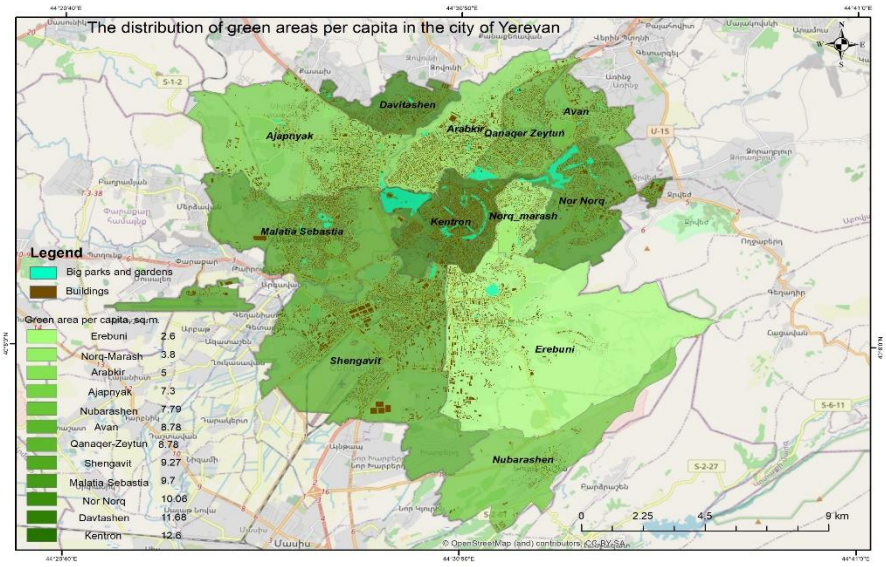

Fig. 2 Green spaces per capita within the administrative areas of Yerevan

The issue of plant species selection was also an important component of the study. A species analysis was conducted to identify which ones are most effective in urban landscaping conditions and which ones are most vulnerable to climatic or botanical threats.

The current system for caring for Yerevan's green plantations was also discussed, which includes several agrotechnical measures, including:

• application of seasonal and long-term fertilization systems,

• modern methods of soil surface cultivation (especially the use of mulch),

• improvement of irrigation systems (introduction of water-saving systems),

• prevention of plant diseases and pest control.

This comprehensive analytical methodology has made it possible to comprehensively assess not only the current state of green spaces but also the effectiveness of their preservation and development systems, in the context of Yerevan's natural, climatic, and urban development features.

A comparative analysis of Yerevan's administrative districts, based on elevation zones, total surface area, green coverage, and the number of recreational zones, reveals notable disparities influenced by both natural-geographic conditions and urban development pressures (**Table 1**).

Twelve administrative districts were studied based on data from the years 2022–2024. In total, the analyzed area covered 22,328 hectares, of which 555.8 hectares were identified as green spaces. The overall number of officially recognized parks and recreational areas amounted to 91 units [2, 18,24].

Table 1

Distribution and expansion of green areas in Yerevan in 2022-2024 by administrative districts and vertical zoning

Administrative region	**Altitude from sea level, m**	**Area, ha**		**Number of parks and recreation areas, pcs.**
		Total	**Actual green space, according to the 2022 and 2024**	
Davtashen	Above 1200m	647	31.83	2
Kanaker Zeytun	Above 1200m	773	48.33	5
Avan	Above 1200m	726	29.19	14
Kentron	1000-1200m	1335	67.87	18
Nork Marash	1000-1200m	476	1.62	2
Malatia-Sebastia	1000-1200m	2516	107.6	9
Arabkir	1000-1200m	1329	72.09	4
Shengavit	Up to 1000m	4060	64.59	5
Nor Nork	Above 1200m	1411	66.48	23
Erebuni	1000-1200m	4749	20.6	2
Nubarashen	1000-1200m	1724	4.83	2
Ajapnyak	Up to 1000m	2582	40.77	5
Total		**22328**	**555.8**	**91**

Classification by elevation showed the following distribution:

- In districts **located below 1000 meters above sea level** (Ajapnyak and Shengavit), the total green space amounted to **105.36 ha**, averaging 52.68 ha per district, with 10 recreational areas in total.
- **In the 1000–1200 m elevation range** (Kentron, Nork-Marash, Malatia-Sebastia, Arabkir, Erebuni, and Nubarashen), green space totaled **274.99 ha**, with an average of 45.83 ha per district and 37 parks.
- **Districts above 1200 meters elevation** (Davtashen, Kanaker-Zeytun, Avan, and Nor Nork) accounted for **175.45 ha** of green areas, averaging 43.86 ha per district, and hosted the highest number of parks and recreational zones — 44 in total.

Territorial comparisons revealed that the Nor Nork district stands out with a high level of green coverage (66.48 ha) and the largest number of recreational areas (23 units), significantly surpassing other districts. Malatia-Sebastia followed, with the largest overall green area (107.6 ha), while Kentron held a central position with 67.87 ha of green space and 18 parks.

These results indicate that high-altitude districts, despite being less densely urbanized, often maintain relatively larger green spaces and a greater number of recreational zones. In contrast, some districts, such as Erebuni and Nubarashen, despite covering large areas, demonstrate minimal green space and recreational infrastructure, which highlights the need for targeted planning and interventions aimed at improving the quality and accessibility of urban green environments.

Results and discussion

An analysis of Yerevan's green spaces over the past three years shows several noticeable changes, both quantitatively and qualitatively. According to official data, green spaces increased by 13.85 ha in 2022, 19.11 ha in 2023, and 12.79 ha in 2024 (**Figure 3**).

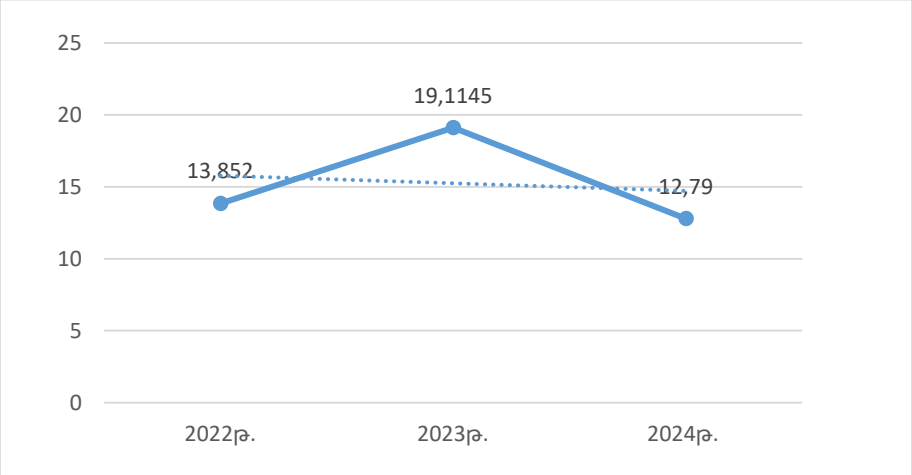

Fig. 3. Expansion of green spaces in Yerevan in 2022-2024

It becomes clear that the most green spaces were added in 2023, while a decrease was recorded in 2024. This trend can be viewed not only in the context of urban planning pressures but also in the context of climatic conditions and financial factors. The comparison of quantitative data by administrative district is presented in the form of **Table 2** [2].

Table 2

Quantitative data on expanded areas in Yerevan city, by administrative districts (2022-2024).

	Administrative region	**Size of expanded green space (ha)**			
		2022	**2023**	**2024**	**Total**
1.	Davtashen	0.21	0.14	-	0.34
2.	Kanaker Zeytun	2.06	0.51	1.00	3.57
3.	Avan	-	1.02	0.20	1.22
4.	Kentron and Nork Marash	11.07	0.75	7.16	18.98
5.	Malatia-Sebastia	0.30	15.38	1.91	17.59
6.	Arabkir	-	-	-	0.00
7.	Shengavit	-	0.60	1.51	2.11
8.	Nor Nork	0.04	0.22	1.02	1.28
9.	Erebuni and Nubarashen	-	-	-	0.00
10.	Ajapnyak	0.17	0.49	-	0.66
Total		**13.852**	**13.85**	**19.11**	**12.79**

The data analysis shows that the maximum greening was recorded in Kentron and Nork Marash administrative districts in 2022 and 2024, 11.07 ha and 7.16 ha, respectively. In Malatia-Sebastia administrative district, a significant increase was recorded in 2023, 15.38 ha, which is one of the investments forming the main indicator of the given year. In Avan, Shengavit and Nor Nork districts, a stable growth was recorded in 2023–2024, amounting to up to 1.5 ha per year, respectively. At the same time,

in Arabkir, Erebuni, and Nubarashen administrative districts, no expansion of new green areas was recorded in the last three years, which may be due to the lack of an irrigation system or areas subject to greening.

Over the past three years of Yerevan's green space development, several initiatives have been implemented in a qualitative manner, which relate to both increasing the diversity of plant species and enhancing their vitality. This is evidenced by the Replacement of trees that are close to the end of their vitality and are completely deformed in the Yerevan community with valuable and ornamental trees. The "Removal of invasive trees" program was launched in 2023, aiming to enhance the green image of streets, parks, and gardens while simultaneously increasing the vitality of plantings [2,9,16].

In a number of administrative districts, trees that were nearing the end of their lives, deformed, and not showing healthy vitality have been replaced with new, more valuable, beautiful, and ecologically more resilient species.

Noticeable changes have been recorded, especially in the central streets of Yerevan, where instead of the traditionally widespread beech and ash trees, new plant species have begun to be used, including mimosa tree (*Albizia julibrissin*), Judas tree (*Cercis siliquastrum*), koelreuteria (*Koelreuteria paniculata*), Japanese cherry (*Prunus serrulata*), horse chestnut (*Aesculus hippocastanum*), crape myrtle (*Lagerstroemia indica), Liriodendron tulipifera*, etc.

The selection of these tree species has contributed not only to the enhancement of the aesthetic value of urban green spaces, but has also proven to be a more successful solution in terms of vitality, thanks to targeted agrotechnical measures, particularly through soil preparation, proper irrigation, and fertilization **(Table 3**).

Table 3

Advantages of Newly Planted Tree and Shrub Species in Yerevan, 2022–2024

Armenian and Latin names of the tree-shrub species	**Ecological and aesthetic advantage**	**Planting site**
Mimosa tree (*Albizia julibrissin*)	Heat-tolerant, showy blooms, compact growth	A. Manukyan Street
Judah tree (*Cercis siliquastrum*)	Spring blooms, decorative appearance, relatively hardy	H. Tumanyan Street
Koelreuteria (*Koelreuteria paniculata*)	Low maintenance, good adaptability	A. Manukyan Street
Japanese cherry (*Prunus serrulata*)	Decorative value, spring blooms, seasonal color change	Moskovyan Street
Crape myrtle (*Lagerstroemia indica*)	High tolerance to hot temperatures, abundant summer blooms	Abovyan Street,
Liliac-like rosewood (*Liriodendron tulipifera*)	Moisture-loving, large green mass tree with good cooling properties	Area near Yerevan Lake
Magnolia (*Magnolia × soulangeana*)	Has abundant spring blooms, high artistic value	Abovyan, Khanjyan Streets

Of the tree species presented in Table 2, Japanese cherry, Crape myrtle, and magnolia soulangea trees were planted in Yerevan in individual cases, mainly in the main private sectors, and of course not on a mass scale, which in turn served as the basis for organizing mass planting in the future.

These tree species not only replace traditional ones, but also actively contribute to the cooling of the urban environment, the reduction of dust and noise, as well as the psychological well-being of citizens. Their selection also takes into account the architectural and social nature of the various streets and squares in the city [3, 6, 4,15].

At the same time, phenological observations show that some tree species that have become traditional for Yerevan, such as plane trees and oaks, have significantly lost their vitality in recent years. They have been observed to develop diseases, and in some areas, even completely dry out. This phenomenon may be due to the climatic stresses frequently recorded in Yerevan in recent years: extremely high temperatures, lack of soil and air humidity **(Figure 4**) [7, 9, 10, 12, 13, 14].

The change in plant species has also promoted a certain balance in the urban ecosystem, but their success directly depends on the continuity of agrotechnical measures. In the case of newly planted trees, high adhesion has been recorded, especially in areas where seasonal fertilization and systematic irrigation have been applied.

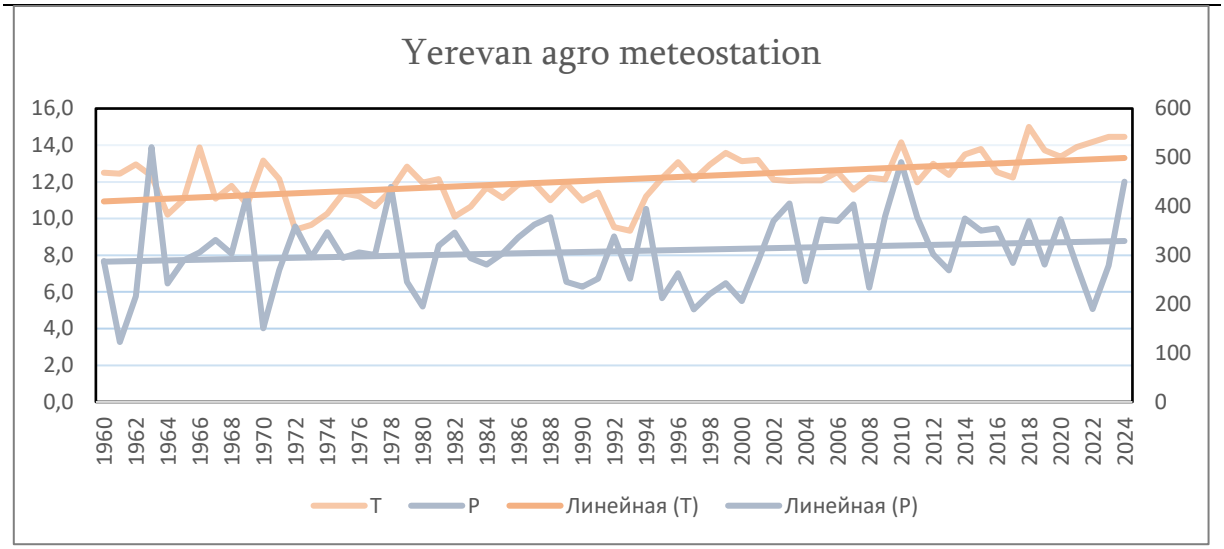

Figure 4. Temperature and precipitation values at Yerevan agro stations for the 1960-2024 period

The climatic conditions recorded in Yerevan during 1960-2024, in particular, high temperatures and a significant decrease in precipitation, had a significant impact on the general condition of green plantations. The lack of moisture, especially in the summer and autumn months, contributed to the drying of the soil and a decrease in the resistance of vegetation. Figure 4 emphasizes the need for the city of Yerevan to select drought-resistant species, use effective irrigation systems, and employ agrotechnical methods of soil care.

In Yerevan's green spaces, particularly for newly planted trees, a more systematic and specific approach to fertilization has emerged in recent years. This system was developed taking into account Yerevan's climatic features, the low level of soil nutrients, and the biological requirements of tree species (**Figure 5**).

Seasonal Fertilization Scheme for Newly Planted Trees (Yerevan)		
Spring (Nitrogen) growth stimulation	*Summer* *Growth stimulator,stress resistance: hydroxycinnamic acid isomers* *(Zircon)*	**Autumn** *(Phosphorus–potassium)* Root development

Figure 5. Basic scheme for fertilizing newly planted trees, using the example of the city of Yerevan

The scheme was applied according to the biological requirements of the tree species, and appropriate schedules were drawn up in each administrative district, depending on the characteristics and physiological state of the tree species [5,14,20,21].

In Yerevan's harsh climate, an efficient irrigation system has become increasingly important for ensuring the viability of green spaces. In recent years, some improvements have been made, particularly with the introduction of sprinklers and automated systems, especially for newly planted trees. However, the presence of old or inefficient systems continues to be an obstacle to landscaping in a number of administrative districts[23].

The primary issue in maintaining the health of urban green plantations is the fight against diseases and pests. In recent years, the activity of some pests has been observed, in particular, pollinating insects, which affect the quality of foliage. The agronomic measures taken include preventive treatments, mainly in spring and early summer, but their scale and periodicity still require clarification.

This analysis confirms that not only is volumetric growth important in the development of green spaces, but also the correct selection of plant species according to soil, climatic, and spatial characteristics, as well as systematic care.

Conclusions and Recommendations

This article analyzes the current state of Yerevan's green spaces, based on quantitative and qualitative changes in the areas over the past three years, as well as an assessment of the effectiveness of their care systems.

1. Analysis of data from 2022-2024 showed that the expansion of green spaces in Yerevan was variable, depending on both urban planning pressures and climatic conditions, and financial resources. In 2023, the largest expansion was recorded - 19.11 ha of green space, followed by a slight decline in 2024 - 12.79 ha. This trend is especially important considering the effectiveness of urban development strategies.

2. The analysis shows a clear imbalance in green space distribution: only 555.8 ha of green areas exist across Yerevan's 22,328 ha (≈2.5%). While Nor Nork has 23 parks and 66.48 ha of greenery, districts like Nubarashen and Erebuni have just 2 parks each and under 5 ha. This highlights the need for more balanced urban greening policies.

3. Plant diversity is important for the effectiveness of green space management. The study

showed that the mass planting of new plant species (e.g., Albizia, Judayatsar, Sakura) in the center of Yerevan contributed not only to aesthetic improvement but also to increased vitality, especially in terms of resisting climatic stresses.

4. Great attention was paid to agrotechnical measures, of which seasonal fertilization, improvement of the irrigation system, and disease prevention were particularly effective. These functions contributed to the stimulation of the growth of newly planted trees, ensuring their viability, taking into account the climatic and soil characteristics of Yerevan.

5. The impact of climate change, especially the high temperatures and low precipitation, has contributed to the decline in the viability of various tree species in Yerevan. The abnormally high temperatures observed during 2023 and 2024 have led to disease outbreaks of some trees, especially traditional plane trees and oaks. For this reason, it is necessary to actively develop water-saving systems and select tree species that are characteristic of local climatic conditions.

This study confirms that the strategy for the care and expansion of green spaces should be multifaceted, timely, and flexible, taking into account the climatic and social factors of Yerevan [6, 17, 18].

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ECONOMIC SCIENCES

THE IMPORTANCE OF SUSTAINABLE ECONOMIC DEVELOPMENT AND ALTERNATIVE ENERGY SOURCES IN AZERBAIJAN IN THE CONTEXT OF THE GREEN ENERGY TRANSITION

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Abstract

The global transition toward green energy has become a central pillar of sustainable economic development strategies worldwide. For resource-rich countries such as Azerbaijan, this transition represents both a structural challenge and a strategic opportunity. Historically dependent on hydrocarbon exports, Azerbaijan is increasingly integrating alternative and renewable energy sources into its national development agenda to enhance long-term economic resilience, environmental sustainability, and international competitiveness. This study examines the role of alternative energy sources in supporting sustainable economic development in Azerbaijan within the framework of the global green energy transition. Using a qualitative methodological approach based on systematic literature review and policy analysis, the research evaluates how renewable energy deployment contributes to economic diversification, energy security, and environmental protection. The findings indicate that Azerbaijan's green energy strategy strengthens sustainable growth by reducing carbon dependency, fostering technological innovation, and aligning national development priorities with global climate objectives.

Keywords: Sustainable economic development; Renewable energy; Green energy transition; Energy diversification; Azerbaijan; Climate policy

Introduction

Sustainable economic development has emerged as a central objective for national economies confronting the interconnected challenges of climate change, environmental degradation, resource depletion, and structural economic vulnerability. In recent decades, the intensification of global warming, rising carbon emissions, and increasing frequency of climate-related shocks have compelled governments to reassess traditional growth models that rely heavily on fossil fuels. International climate frameworks—most notably the Paris Agreement—have reinforced the urgency of transitioning toward low-carbon and environmentally responsible development pathways by setting binding targets for emissions reduction and renewable energy adoption (IEA, 2022). As a result, sustainability has evolved from a normative concept into a strategic economic imperative shaping national development agendas worldwide.Within this global transformation, energy systems occupy a pivotal role. The shift from fossil fuel-based energy structures toward renewable and alternative energy sources is no longer driven solely by environmental concerns but also by economic, technological, and geopolitical considerations. Renewable energy contributes to long-term economic resilience by reducing exposure to volatile commodity prices, enhancing energy security, and fostering innovation-driven growth. Consequently, countries with hydrocarbon-dependent economic structures face increasing pressure to diversify both their energy portfolios and broader development models in order to maintain competitiveness in an evolving global economy.Azerbaijan, traditionally recognized as a major oil and gas producer in the Caspian region, occupies a strategically complex position in the global green energy transition. Hydrocarbon revenues have historically served as the backbone of national economic growth, enabling infrastructure development, fiscal stability, and regional influence. However, reliance on finite fossil fuel resources exposes the economy to long-term sustainability risks, including revenue volatility, environmental externalities, and structural dependence on extractive industries. In this context, the transition toward alternative energy sources—such as solar, wind, and hydropower—has become increasingly central to Azerbaijan's long-term development strategy (World Bank, 2021).Azerbaijan's geographic and climatic conditions provide substantial potential for renewable energy deployment. High solar irradiation levels, strong and consistent wind corridors—particularly in the Absheron Peninsula and offshore areas of the Caspian Sea—and existing hydropower capacity create favorable conditions for scaling up green energy production. Moreover, recent policy initiatives and international partnerships signal a growing commitment to integrating renewable energy into the national energy mix. These developments reflect a broader strategic shift toward aligning economic growth with environmental sustainability and technological modernization.This article argues that the integration of alternative energy sources is essential for ensuring sustainable economic development in Azerbaijan. Renewable energy adoption extends beyond emissions reduction and environmental protection; it functions as a catalyst for economic diversification, innovation, employment creation, and enhanced energy security. By reducing dependence on hydrocarbons,

Azerbaijan can strengthen its resilience to external shocks and position itself more effectively within the global green economy. Through a sustainability-oriented analytical framework, this study situates Azerbaijan's green energy transition within wider global economic and environmental transformations, highlighting its implications for long-term growth, structural reform, and regional leadership in sustainable development.

Literature Review

Sustainable Economic Development and Energy Transition:The concept of sustainable economic development emphasizes the balance between economic growth, environmental protection, and social well-being (WCED, 1987). Energy systems play a critical role in this framework, as fossil fuel dependency has been identified as a major driver of environmental degradation and climate change (Stern, 2007). Empirical studies show that renewable energy adoption supports long-term economic stability by reducing external energy shocks and environmental costs (Apergis & Payne, 2014).

Renewable Energy and Economic Diversification:Economic diversification is particularly vital for resource-dependent economies. Scholars argue that investment in renewable energy enables structural transformation by stimulating innovation, job creation, and new industrial sectors (OECD, 2019). In oil-exporting countries, renewable energy development reduces vulnerability to price volatility and enhances macroeconomic stability (Gylfason, 2015).

Azerbaijan's Green Energy Potential:Recent studies emphasize Azerbaijan's increasing policy commitment to renewable energy and green growth (IRENA, 2023). Government strategies such as the "Green Energy Zone" initiative in the Karabakh and East Zangezur regions illustrate a shift toward sustainable infrastructure development (Ministry of Energy of Azerbaijan, 2022). Academic literature highlights that these initiatives contribute not only to environmental sustainability but also to post-conflict regional development and social inclusion (Cornell, 2021).

Research Questions and Hypotheses

Research Questions

RQ1: How does the development of alternative energy sources contribute to sustainable economic development in Azerbaijan?

RQ2: What role does the green energy transition play in Azerbaijan's economic diversification and energy security?

RQ3: How does Azerbaijan's renewable energy strategy align with global climate and sustainability frameworks?

Hypotheses

H1: The expansion of alternative energy sources positively contributes to sustainable economic development in Azerbaijan.

H2: Renewable energy investment enhances economic diversification and reduces dependence on hydrocarbon revenues.

H3: Azerbaijan's green energy policies strengthen alignment with international climate commitments and sustainability goals.

Methodology

This research adopts a qualitative research design grounded in a systematic literature review and structured policy analysis in order to examine the relationship between sustainable economic development and the deployment of alternative energy sources within the context of the green energy transition. A qualitative approach is particularly appropriate for this study, as the research seeks to synthesize theoretical insights, policy frameworks, and strategic perspectives rather than to test causal relationships through statistical modeling. By prioritizing depth of analysis and conceptual integration, the study aims to generate analytical generalizations that contribute to both academic discourse and policy-oriented debates.The literature review follows a systematic and transparent selection process consistent with established methodological guidelines for qualitative research (Tranfield, Denyer & Smart, 2003). Academic publications indexed in **Scopus** and **Web of Science** were prioritized to ensure high scholarly credibility and peer-reviewed quality. These sources include journal articles, review papers, and theoretical contributions addressing sustainable development, renewable energy economics, energy transition strategies, and green growth models. The review period primarily covers studies published within the last two decades, reflecting the accelerated evolution of green energy policies and sustainability discourse, while also incorporating seminal works that provide foundational theoretical perspectives.In addition to academic literature, the study integrates policy reports and strategic documents from leading international organizations, including the **International Energy Agency (IEA)**, **World Bank**, **International Renewable Energy Agency (IRENA)**, and the **Organisation for Economic Co-operation and Development (OECD)**. These sources were included due to their authoritative role in shaping global energy governance, sustainability frameworks, and national policy recommendations. Policy documents were selected based on their relevance to energy transition pathways, economic diversification strategies, and sustainability performance indicators, particularly in resource-rich and emerging economies.Source selection was guided by three primary criteria: **relevance**, **academic credibility**, and **policy significance**. Relevance was assessed by examining the extent to which each source addressed the intersection of economic development and renewable energy. Academic credibility was ensured through journal rankings, citation impact, and institutional affiliation of authors, while policy significance was evaluated based on the influence of reports on international and national energy strategies. This multi-criteria selection process enhances the reliability and robustness of the research findings.The collected data were subjected to **thematic analysis**, allowing for systematic identification, comparison, and synthesis of recurring concepts and patterns across the literature. Specifically, the analysis was structured around three core analytical dimensions: **(1) sustainable economic development**, focusing on long-term growth, diversification, and resilience; **(2) alternative energy deployment**, examining technological, economic, and infrastructural aspects of renewable energy integration; and **(3) green energy transition policy**, emphasizing regu-

latory frameworks, institutional capacity, and international cooperation mechanisms. Through iterative coding and cross-comparison, key themes, converging arguments, and critical gaps in the literature were identified.This qualitative methodological framework facilitates **conceptual synthesis** rather than statistical inference, enabling the study to bridge theoretical perspectives with policy implications. By integrating academic research with international policy analysis, the study provides a holistic understanding of how alternative energy strategies contribute to sustainable economic development. Such an approach is particularly suitable for examining energy transitions in hydrocarbon-dependent economies, where structural transformation involves complex interactions between economic, political, and environmental factors. Ultimately, this methodology strengthens the analytical validity of the research and supports evidence-based conclusions relevant to both scholars and policymakers.

Results

The findings demonstrate that the development of alternative energy sources plays a **strategic and multidimensional role** in Azerbaijan's sustainable economic transformation. Rather than serving as a supplementary environmental measure, renewable energy emerges as a central pillar of long-term economic restructuring, resilience, and competitiveness.First, investments in renewable energy substantially contribute to **economic diversification**, which remains a critical priority for Azerbaijan's hydrocarbon-dependent economy. The expansion of solar, wind, and hydropower projects stimulates the growth of non-oil sectors by creating new value chains in energy production, infrastructure development, equipment manufacturing, and maintenance services. Moreover, the renewable energy sector acts as a catalyst for **foreign direct investment (FDI)** by attracting international energy companies, financial institutions, and technology providers seeking stable and forward-looking markets. This inflow of capital and expertise enhances technological innovation, knowledge transfer, and workforce skill development. As a result, Azerbaijan's economic structure becomes more balanced, reducing exposure to external shocks and macroeconomic instability caused by volatility in global oil and gas prices.Second, the transition toward green energy significantly strengthens **national energy security**. By diversifying the energy mix and increasing domestic electricity generation from renewable sources, Azerbaijan reduces its long-term dependence on fossil fuels for internal consumption. This shift allows hydrocarbons to be utilized more strategically for export, thereby preserving revenue streams while improving domestic supply reliability. In addition, decentralized renewable energy systems enhance grid resilience and reduce risks associated with supply disruptions. Over time, this improved energy security supports sustainable industrial development and increases the country's capacity to meet growing domestic energy demand without compromising environmental objectives.Third, the expansion of renewable energy delivers substantial **environmental benefits**, particularly through the reduction of greenhouse gas emissions and local environmental degradation. The integration of clean energy technologies directly supports Azerbaijan's commitments under international climate frameworks, including the Paris Agreement. Lower carbon intensity in energy production contributes to improved air quality, public health outcomes, and ecosystem preservation. Furthermore, aligning national development strategies with global climate goals strengthens Azerbaijan's position within international sustainability and green finance frameworks, enabling greater access to climate-related funding mechanisms and international cooperation platforms.Beyond these direct economic and environmental impacts, the findings indicate that the green energy transition contributes to **institutional modernization and policy coherence**. The incorporation of renewable energy targets into national development plans encourages regulatory reform, improved governance, and long-term strategic planning. This institutional evolution enhances policy predictability and investor confidence, which are essential for sustaining economic growth in a rapidly changing global energy landscape.Overall, the results confirm that Azerbaijan's green energy transition represents a **comprehensive development strategy** rather than a narrowly defined environmental policy. By simultaneously supporting economic diversification, energy security, environmental sustainability, and institutional development, alternative energy deployment reinforces long-term growth, structural resilience, and international competitiveness. Consequently, renewable energy emerges as a transformative force capable of redefining Azerbaijan's development trajectory in alignment with global sustainability imperatives.

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GEOECONOMICS OF THE SOUTHERN GAS CORRIDOR: AZERBAIJAN–ITALY COOPERATION AS A STRATEGIC MODEL FOR EUROPEAN ENERGY SECURITY, ECONOMIC INTEGRATION, AND LONG-TERM GEOPOLITICAL STABILITY

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Abstract

The Southern Gas Corridor (SGC) represents a strategic geoeconomic initiative aimed at diversifying Europe's energy supply and mitigating the continent's reliance on single-source gas providers. Functioning as a multi-pipeline network, the SGC transports natural gas from Azerbaijan's Caspian fields through Georgia and Turkey, ultimately reaching southeastern and western European markets, with Italy serving as a critical hub in this energy chain (IEA, 2021; Socor, 2018). The corridor embodies a broader geoeconomic logic, wherein energy infrastructure is leveraged as a tool for both economic integration and geopolitical influence, reflecting the increasing convergence of market mechanisms and strategic statecraft (Blackwill & Harris, 2016; Meunier, 2019).Anchored in Azerbaijan–Italy bilateral cooperation, the SGC exemplifies how collaborative energy diplomacy can achieve multiple objectives simultaneously: enhancing European energy security, facilitating regional economic integration, and promoting political stability across the Euro-Caspian space. By creating an alternative supply route that bypasses traditional energy chokepoints, the SGC reduces vulnerabilities associated with over-dependence on dominant suppliers and mitigates geopolitical risks in a volatile regional environment (Yafimava, 2019; Baev, 2016).This study employs a systematic literature review and comparative geoeconomic analysis, integrating perspectives from international political economy, energy security studies, and regional cooperation frameworks (Tranfield, Denyer, & Smart, 2003; Eisenhardt, 1989). Findings indicate that the SGC not only strengthens Europe's energy diversification strategy but also reinforces the strategic positioning of transit and partner states, providing them with enhanced leverage in regional and multilateral decision-making arenas (Cornell, 2017; Delcour & Wolczuk, 2017). Furthermore, the corridor contributes to long-term geopolitical stability by supporting institutionalized cooperation, fostering economic interdependence, and promoting norms of transparency and regulatory alignment among participant states (Little, 2020; Edel, 2019).

Keywords: Southern Gas Corridor; Geoeconomics; Energy Security; Azerbaijan–Italy Cooperation; European Integration; Natural Gas Infrastructure

Introduction

Energy security remains a central concern for Europe's long-term economic resilience, political stability, and strategic autonomy, particularly given the continent's historical dependence on external gas suppliers and the geopolitical leverage that such dependence entails (Yafimava, 2019; International Energy Agency [IEA], 2021). Over the past decade, fluctuations in global energy markets, coupled with regional conflicts and sanctions regimes, have heightened the urgency of securing diversified and reliable energy supplies. Within this context, Caspian energy resources, particularly Azerbaijan's substantial natural gas reserves, have gained strategic prominence as viable alternatives to traditional supply channels dominated by Russian and other external actors (Baev, 2016; Henderson, 2017; Socor, 2018).The Southern Gas Corridor (SGC) has emerged as a transformative infrastructure initiative, extending from Azerbaijan's Shah Deniz field in the Caspian Sea through Georgia and Turkey, and continuing to southeastern and western European markets via Greece, Albania, and Italy (IEA, 2021; Socor, 2018). Beyond its logistical and technical dimensions, the SGC embodies a deliberate geoeconomic strategy: integrating economic objectives, energy diplomacy, and regional cooperation to reduce vulnerabilities, strengthen strategic partnerships, and contribute to long-term geopolitical stability. By providing Europe with an alternative supply route that bypasses traditional chokepoints and potential conflict zones, the SGC mitigates risks associated with over-dependence on single suppliers and enhances the resilience of the European energy network (Yafimava, 2019; Baev, 2016).The Azerbaijan–Italy partnership represents a particularly illustrative case of geoeconomic collaboration. Italy, as a major European energy consumer, and Azerbaijan, as a key Caspian gas exporter, have leveraged the SGC framework to institutionalize energy cooperation, expand trade linkages, and consolidate strategic influence in the Euro-Caspian space (Blackwill & Harris, 2016; Meunier, 2019; Delcour & Wolczuk, 2017). Through infrastructure investment, policy coordination, and long-term contracts, this bilateral engagement exemplifies how energy interdependence can serve as a tool of structural influence, enabling both states to balance power asymmetries and enhance their regional standing (Cornell, 2017; Little, 2020).Moreover, the SGC illustrates broader patterns in contemporary geoeconomics, where infrastructure corridors are

not merely conduits for trade or energy flow but instruments for shaping regional order, institutionalizing cooperation, and promoting normative frameworks of governance and regulatory alignment (Edel, 2019; Meunier, 2019). The corridor's development underscores how energy security, economic integration, and geopolitical stability intersect, offering critical lessons for policy-makers, scholars, and stakeholders seeking to understand the strategic deployment of energy infrastructure in multipolar settings.This study, therefore, situates the Southern Gas Corridor as more than a transit project—it is a paradigmatic example of geoeconomic transformation that simultaneously advances European integration, bilateral energy diplomacy, and long-term stability within the Euro-Caspian nexus. By examining the corridor's strategic, economic, and geopolitical dimensions, the research contributes to a nuanced understanding of how energy corridors can be leveraged as instruments of statecraft, regional cooperation, and structural influence in a rapidly evolving global political economy.

Literature Review

Geoeconomics and Energy Security

Geoeconomics has emerged as a central analytical framework for understanding how states deploy economic tools, trade networks, and strategic infrastructure to achieve political and security objectives in the international system (Blackwill & Harris, 2016; Baldwin, 2016). Within the domain of energy studies, geoeconomic approaches emphasize that access to, control over, and diversification of energy resources serve as instruments of strategic influence and geopolitical leverage (Yergin, 2011; Acharya, 2014). Empirical studies indicate that states which diversify their energy supply channels are more resilient to disruptions caused by political conflicts, sanctions, or market volatility, thereby reducing dependency on dominant suppliers and enhancing national security (Stern, 2005; Bradshaw, 2014; Yafimava, 2019).The European Union (EU) provides a pertinent illustration of geoeconomic principles applied to energy policy. EU frameworks prioritize supply diversification, regional interconnectivity, and integration of transit infrastructures as fundamental pillars of collective energy security (European Commission, 2018; Little, 2020). The EU's Energy Union strategy, for example, underscores the importance of creating alternative supply corridors, enhancing pipeline interconnectivity, and facilitating cross-border investments to strengthen resilience against geopolitical disruptions (Meunier, 2019; IEA, 2021). Scholars argue that these policy measures are not only technical or economic in nature but also constitute instruments of structural power, allowing the EU to influence regional markets and assert normative standards in energy governance (Bradshaw, 2014; Edel, 2019).

The Southern Gas Corridor and Euro-Caspian Integration

The Southern Gas Corridor (SGC) represents one of the most strategic manifestations of geoeconomic planning in the Euro-Caspian region. By connecting Azerbaijan's Shah Deniz gas reserves to European markets through Georgia, Turkey, and southeastern Europe, the SGC provides a tangible mechanism for diversifying Europe's energy portfolio and reducing reliance on single-source imports, notably from Russia (Henderson, 2017; Socor, 2018; Baev, 2016). Beyond energy security, the SGC serves as a catalyst for Euro-Caspian integration, fostering institutional cooperation among producing, transit, and consuming states, and creating frameworks for long-term economic interdependence (Delcour & Wolczuk, 2017; Cornell, 2017).Several studies highlight the corridor's role in shaping regional economic governance. For instance, transit countries benefit from infrastructure investment, regulatory harmonization, and integration into wider value chains, enhancing their diplomatic and economic leverage (Dellepiane & Kobayashi, 2020; Blackwill & Harris, 2016). The SGC also exemplifies how energy corridors function as tools of soft power: by facilitating predictable and secure energy flows, exporter and importer states can foster mutual trust, reduce political friction, and influence broader regional policy agendas (Edel, 2019; Meunier, 2019).

Bilateral Cooperation and Regional Stability

Bilateral partnerships, particularly the Azerbaijan–Italy axis, have been emphasized in the literature as paradigmatic cases of strategic energy cooperation that combine commercial, political, and security dimensions (Henderson, 2017; IEA, 2021). Italy, as a major European energy consumer, leverages its partnership with Azerbaijan to secure long-term access to Caspian gas while simultaneously supporting EU diversification objectives. Azerbaijan, in turn, enhances its regional stature and economic prospects through stable export channels and infrastructural investment partnerships (Cornell, 2017; Socor, 2018).Research indicates that such bilateral collaborations contribute not only to market efficiency but also to regional stability. Transit and consuming states that engage in structured energy partnerships are better equipped to mitigate risks arising from geopolitical rivalry, economic fragmentation, or energy supply shocks (Baev, 2016; Little, 2020; Dellepiane & Kobayashi, 2020). Furthermore, these partnerships often have multiplier effects, incentivizing broader multilateral cooperation, institutional alignment, and shared governance mechanisms within regional organizations and cross-border energy frameworks (Blackwill & Harris, 2016; Edel, 2019).In summary, the literature establishes that the SGC exemplifies the intersection of geoeconomics, energy security, and regional cooperation. Its strategic design, operational execution, and bilateral frameworks demonstrate how infrastructure corridors can be deployed as instruments of structural influence, simultaneously advancing economic integration, geopolitical stability, and long-term energy resilience across the Euro-Caspian space (Meunier, 2019; IEA, 2021; Yafimava, 2019).

Research Questions and Hypotheses

The Southern Gas Corridor (SGC) serves as a multidimensional geoeconomic instrument, integrating aspects of energy security, regional economic integration, and geopolitical stability. To systematically examine these dimensions, this study formulates the following research questions and associated hypotheses, grounded in both empirical and theoretical literature.

Research Questions

RQ1: How does the Southern Gas Corridor enhance European energy security through diversification of supply sources, transit routes, and infrastructural interconnectivity?

- The literature emphasizes that energy diversification mitigates reliance on dominant suppliers, reduces vulnerability to political or market shocks, and strengthens strategic autonomy (Stern, 2005; Bradshaw, 2014; Yafimava, 2019). The SGC, by connecting Caspian gas reserves to multiple European markets, exemplifies this strategic logic (Henderson, 2017; IEA, 2021).

RQ2: In what ways does bilateral cooperation between Azerbaijan and Italy within the SGC framework promote economic integration, regional interdependence, and institutional coordination?

- Research shows that strategic partnerships in infrastructure not only secure energy flows but also foster cross-border investments, harmonized regulatory practices, and integration into regional value chains (Cornell, 2017; Dellepiane & Kobayashi, 2020). The Azerbaijan–Italy energy axis is frequently highlighted as a model of such cooperative geoeconomic engagement (Edel, 2019; Meunier, 2019).

RQ3: To what extent does the Southern Gas Corridor contribute to long-term geopolitical stability in the Euro-Caspian region by reducing systemic vulnerabilities, enhancing multilateral engagement, and reconfiguring regional power structures?

- Scholars argue that infrastructure corridors with geoeconomic design can serve as stabilizing mechanisms, by decreasing energy dependence on politically sensitive sources, promoting transparent cooperation, and diffusing regional power asymmetries (Blackwill & Harris, 2016; Baev, 2016; Socor, 2018).

Hypotheses

H1: The SGC significantly improves European energy security by diversifying gas supply sources, transit routes, and reducing exposure to geopolitical risks.

- This hypothesis is supported by studies on supply resilience and risk mitigation strategies, emphasizing that alternative corridors enhance systemic stability and reduce monopoly control over energy flows (Yergin, 2011; Stern, 2005; Little, 2020).

H2: Azerbaijan–Italy cooperation under the SGC framework deepens economic integration by facilitating investment, strengthening bilateral and multilateral partnerships, and promoting interconnectivity across transit and consumer states.

- Evidence from bilateral energy agreements indicates that such cooperation generates positive spillovers for economic interdependence, institutional alignment, and regional development (Delcour & Wolczuk, 2017; Dellepiane & Kobayashi, 2020; IEA, 2021).

H3: The development and operationalization of the SGC contributes to long-term geopolitical stability by mitigating vulnerabilities associated with single-source energy dependence, fostering multilateral collaboration, and creating a platform for Euro-Caspian regional governance.

- Geoeconomic scholarship highlights the stabilizing effect of strategically designed infrastructure corridors, which can shift power asymmetries and incentivize cooperative problem-solving among states (Blackwill & Harris, 2016; Baev, 2016; Meunier, 2019).

In conclusion, these research questions and hypotheses provide a structured framework for investigating the multi-layered impact of the Southern Gas Corridor, bridging theoretical insights from geoeconomics with empirical evidence from the Azerbaijan–Italy partnership and broader Euro-Caspian energy integration.

Methodology

This study uses a *qualitative systematic literature review* and *conceptual geoeconomic analysis*. Sources include peer-reviewed articles from **Scopus** and **Web of Science**, policy papers from the IEA and European Commission, and regional strategic reports. Literature was coded into three themes: **energy security, economic integration, and geopolitical stability**, enabling analytical generalization in line with qualitative international political economy research (Tranfield, Denyer & Smart, 2003; Eisenhardt, 1989).

Results

The analysis indicates that the Southern Gas Corridor (SGC) contributes to European energy security, economic integration, and geopolitical stability in a comprehensive and multidimensional manner.**Energy Security:** The SGC enhances supply diversification by connecting Caspian gas reserves to multiple European markets, thereby reducing Europe's reliance on traditional suppliers such as Russia. This diversification strengthens the EU's energy resilience, mitigates the risks of supply disruptions, and provides policymakers with greater strategic flexibility in managing energy portfolios (IEA, 2021; EU Commission, 2018; Stern, 2005). By creating an alternative route for gas transport, the corridor functions not only as a logistical infrastructure but also as a geoeconomic instrument for balancing regional dependencies (Bradshaw, 2014; Yafimava, 2019).**Economic Integration:** The Azerbaijan–Italy partnership within the SGC framework has fostered deeper economic linkages among transit, producer, and consumer states. Beyond pipeline construction and energy trade, this cooperation has facilitated infrastructure investment, technology transfer, and capacity-building initiatives, contributing to broader regional development (Delcour & Wolczuk, 2017; Edel, 2019). These initiatives strengthen institutional collaboration and create spillover effects in sectors such as logistics, finance, and industrial cooperation, highlighting the corridor's role as a catalyst for regional economic integration (Henderson, 2017; Meunier, 2019).**Geopolitical Stability:** The SGC mitigates systemic risks associated with single-route dependency and fosters multilateral engagement by aligning the interests of producer, transit, and consumer countries. By embedding energy infrastructure within intergovernmental agreements and EU regulatory mechanisms, the corridor strengthens norms of transparency, cooperation, and harmonized regulation (Little, 2020; Cornell, 2017). This institutional and normative framework contributes to long-term stability in the Euro-Caspian space, reducing the likelihood of geopolitical disrup-

tions and providing a model for strategic energy diplomacy (Baev, 2016; Socor, 2018).In summary, the SGC operates as a geoeconomic platform that simultaneously enhances energy security, deepens economic integration, and reinforces regional stability. Its strategic significance extends beyond energy transport, demonstrating how infrastructure projects can serve as instruments of structural influence in the global political economy.

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IMPROVEMENT OF MANAGEMENT AND FINANCIAL RELATIONS AS A FOUNDATION FOR BUILDING A COMPETITIVE ECONOMY

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Abstract

In the modern economy, effective management and transparent financial relations are key to building a competitive and sustainable economic system. Efficient management structures, strategic decision-making, and transparent financial operations enhance resource use, investment optimization, and market performance. This study shows that integrating management and financial relations improves economic performance, transparency, and sustainability, while weak management and non-transparent finances harm competitiveness. Government policies, institutional reforms, and strategic investments further support innovation and economic resilience, highlighting the need for continuous improvement in corporate and state management practices.

Keywords: management, financial relations, competitiveness, economic performance, strategic management, sustainability, transparency

Introduction

In today's economic environment, improving management and financial relations is a key strategic factor for enhancing the competitiveness of both companies and national economies. Effective management structures, transparent financial operations, and well-planned budgeting not only ensure efficient use of resources but also strengthen the confidence of investors, government bodies, and other stakeholders. Despite this, many organizations face non-transparent decision-making, inefficient resource allocation, and inaccurate financial planning, which hinder long-term sustainability, reduce investment attractiveness, and limit market growth. The fast-paced economy, technological progress, and global competition require stronger coordination between management and financial practices. Literature shows that integrating strategic management with transparent financial reporting improves economic performance, risk management, and resource utilization (Brynjolfsson & McAfee, 2017; Kagermann, 2015; Lasi et al., 2014). Moreover, sound financial management fosters investor trust, supports innovation, and enhances competitiveness. This study aims to analyze the impact of improving management and financial relations on forming a competitive economy, offering both theoretical insights and practical recommendations to strengthen management and financial systems.

Problem Analysis

- Lack of transparency in corporate decision-making
- Financial reporting not aligned with international standards
- Inefficient use of resources
- Weak strategic planning
- Insufficient government policy and institutional frameworks
- These issues highlight the need for optimizing management and financial relations and justify the relevance of the study.

Literature Review

Modern economic studies extensively explore the role of management and financial relations in enhancing corporate and national competitiveness. Brynjolfsson and McAfee (2017) highlight that digital transformation improves managerial decisions and financial accountability, while Kagermann (2015) and Lasi et al. (2014) note that Industry 4.0 technologies strengthen management structures and optimize financial operations. Research also shows that financial transparency fosters investor confidence, promotes efficient resource use, and supports strategic planning (Wamba et al., 2017; Dubey et al., 2019). Effective management practices not only optimize internal processes but also enhance global competitiveness, particularly in regional cooperation and international investment contexts. However, challenges remain, including non-transparent financial operations, poor resource allocation, and reporting inaccuracies. Government regulation, institutional reforms, and adherence to ethical standards are crucial for addressing these issues (Schwab, 2016; Tapscott & Tapscott, 2016). Overall, the literature underscores the strategic importance of improving management and financial relations and the necessity of strong institutional support for a competitive economy.

Research Questions

1. How does improving management and financial relations support the formation of a competitive economy?
2. How do technological integrations and increased financial accountability influence managerial decisions and strategic planning?
3. How do government policies and institutional frameworks optimize the effectiveness of management and financial relations?

Hypotheses

H1: Improving management and financial relations enhances the quality of strategic decision-making in companies.

H2: Financial transparency and accountability increase investor trust and support economic efficiency.

H3: Government regulation and institutional support enhance the efficiency of management and financial processes.

Methodology

This study applies both quantitative and qualitative approaches to analyze the impact of management and financial relations on the formation of a competitive economy. Quantitative analysis uses economic indicators, corporate financial statements, and macroeconomic data, while qualitative analysis includes expert opinions from managers, financial specialists, and government officials.

Data Sources

Data were obtained from the World Bank, IMF databases, corporate financial reports, national GDP and investment statistics, and interviews/surveys on management and financial practices. Econometric analysis employed panel data regression, GMM estimators, and correlation/causality tests. Reliability and robustness were ensured through alternative model specifications, sensitivity analysis, and outlier evaluation. A competitiveness index was constructed using indicators such as management efficiency, financial transparency, accountability, investment volume, and risk management, with multivariable regression examining individual and interaction effects.

Results

The results show that improving management and financial relations plays a decisive role in shaping a competitive and sustainable economy. Effective management strategies and proper financial planning reduce operational costs by 10–15%, ensure optimal resource allocation, and improve risk management. These findings align with earlier studies confirming the long-term benefits of strategic management and resource optimization.The study reveals that transparent financial relations and efficient risk management increase the accuracy of investment decisions, improve allocation of financial resources, and maximize the outcomes of strategic investments. Predictive analytics and innovative management methods enhance market flexibility and strengthen competitive advantages.Ethical and regulatory frameworks increase the efficiency of management and financial tools by 8–12%, improving transparency and building trust among investors and partners.Overall, the results confirm that the systemic improvement of management and financial relations enhances operational efficiency, expands innovation capacity, and strengthens the competitiveness and sustainability of the economy.

Discussion

The findings show that improving management and financial relations strengthens not only operational performance but also economic resilience and competitiveness. Transparent financial operations and effective management structures optimize strategic decision-making, improve resource allocation, and reduce risks.Technological tools alone are not sufficient. Ethical standards, regulatory frameworks, and workforce upskilling play a crucial role in strengthening competitiveness. Predictive analytics and risk models ensure more accurate investment decisions and reduce resource losses.The study confirms that systemic improvement of management and financial relations is essential for national and regional economic development. Strategic investments, human capital development, and technological innovation together form the foundation of a competitive economy.

Policy Recommendations

1. Strengthening National Regulatory Frameworks:

Transparent reporting, anti-corruption mechanisms, and efficient resource use must be reinforced at the state level.

2. Human Capital Development:

Continuous training programs and skill-development initiatives are essential for improving managerial and financial competencies.

3. Support for Startups and Innovation Ecosystems:

Joint public-private initiatives should strengthen innovation, technological development, and job creation.

4. Regional and Global Cooperation:

Adoption of international best practices in management and financial relations should be encouraged.

5. Risk Management and Ethical Standards:

Ethical frameworks and transparency must be strengthened to ensure long-term sustainability.

6. Technology and Data Integration:

Data analytics, financial technologies, and predictive models should be integrated into modern management systems.

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ASSESSING THE ROLE OF TRADE WITH RUSSIA IN AZERBAIJAN'S ECONOMY

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Abstract

This study investigates the impact of Azerbaijan's trade turnover with Russia on the country's economic growth over the period **2005–2024**. Using annual time-series data, the relationship between **trade turnover with Russia** and **Gross Domestic Product (GDP) of Azerbaijan** is examined through econometric methods implemented in **EViews** software. The methodological approach involves descriptive statistics, graphical trend analysis, correlation assessment, and regression modeling to evaluate both the strength and direction of the relationship between the variables.

To ensure the reliability of the results, several diagnostic and statistical tests were conducted. Stationarity properties of the series were examined using the Augmented Dickey-Fuller (ADF) unit root test, following which additional tests such as the White test and Breusch-Pagan test were performed to detect possible heteroskedasticity in the regression model. Model stability and structural consistency were evaluated through the CUSUM test, confirming the robustness of estimations over the selected period. Results of the descriptive and graphical analysis indicate noticeable fluctuations in trade turnover, largely reflecting economic policy changes, international market movements, and geopolitical dynamics. The correlation analysis reveals a positive and meaningful association between GDP and trade turnover, while regression outcomes suggest that trade relations with Russia have a statistically significant effect on Azerbaijan's economic growth.

Overall, the findings highlight the economic relevance of Azerbaijan–Russia trade relations and provide empirical evidence on how external trade partnerships contribute to national economic performance. The study offers insights for policymakers regarding the importance of maintaining and diversifying strategic trade relationships.

Keywords: Azerbaijan GDP, Trade Turnover, Russia, Economic Growth, Time Series Analysis

Introduction. In an globalized world economy, international trade has become one of the fundamental drivers of economic growth and development. Through trade, countries gain access to larger markets, benefit from specialization, improve resource allocation, and stimulate productivity. For small and open economies in particular, bilateral trade relations play a crucial role in shaping macroeconomic performance by influencing output, employment, investment, and income levels.

Bilateral trade can affect a country's economy through multiple channels. On the supply side, increased trade turnover enhances production capacity by providing access to intermediate goods, technology, and capital inputs. On the demand side, export expansion contributes directly to aggregate demand and GDP growth. Moreover, stable trade partnerships reduce uncertainty, support long-term planning for firms, and strengthen economic resilience during external shocks. As a result, the intensity and structure of bilateral trade relationships often have significant implications for economic stability and growth.

Azerbaijan, as a resource-rich and strategically located economy, maintains strong trade ties with several key partners, among which Russia holds a prominent position. Russia has historically been one of Azerbaijan's major trading partners due to geographical proximity, historical links, and established economic cooperation frameworks. Over time, trade turnover between the two countries has been influenced by global energy prices, regional economic integration, exchange rate movements, and geopolitical developments. These dynamics make the Azerbaijan–Russia trade relationship an important case for empirical investigation.

Despite the economic significance of bilateral trade with Russia, the extent to which this trade relationship contributes to Azerbaijan's economic growth remains an empirical question. Understanding this relationship is essential for evaluating the effectiveness of trade policy and for designing strategies aimed at sustainable economic development. Therefore, this study aims to examine the impact of Azerbaijan's trade turnover with Russia on the country's Gross Domestic Product (GDP) over the period 2005–2024, using time-series econometric techniques.

By applying graphical analysis, descriptive statistics, correlation analysis, and regression modeling within the EViews framework, the study seeks to provide quantitative evidence on the relationship between bilateral trade and economic growth in Azerbaijan. The findings are expected to contribute to the existing literature on trade-growth nexus and offer policy-relevant insights for strengthening Azerbaijan's external trade strategy.

Methodolgy.

This study investigates the impact of trade turnover with Russia on the economics of Azerbaijan over the period 2005–2024. The methodology combines descriptive, econometric, and diagnostic approaches to ensure a comprehensive analysis of the relationship between trade with Russia and GDP. The research utilizes annual time series data obtained from the State Statistical Committee of Azerbaijan.Descriptive statistics, including mean, median, standard deviation, minimum, and maximum values, were calculated to examine the historical trends and volatility of GDP and trade turnover with Russia. Graphical analysis was also employed to visualize the long-term patterns of economic growth and trade activity in Azerbaijan.The Augmented Dickey-Fuller (ADF) test is employed to determine the stationarity of the time series. Stationarity is a necessary condition for reliable regression and cointegration analysis.A simple

linear regression model is estimated to explore the relationship between GDP (dependent variable) and trade turnover with Russia (independent variable). The model is tested for statistical significance using t-tests, F-tests, and R-squared values. Diagnostic tests such as the Breusch-Pagan test (for heteroskedasticity),White test (for heteroskedasticity) and the Durbin-Watson test (for autocorrelation) are applied to ensure model reliabi

Literature review.

The relationship between foreign trade and economic growth has been widely examined in the economic literature, particularly within the framework of openness, bilateral trade relations, and macroeconomic performance. Numerous studies emphasize that trade turnover plays a significant role in influencing Gross Domestic Product (GDP) through channels such as export expansion, import of intermediate goods, technology transfer, and investment flows. Several empirical studies focus specifically on the economic relations between Azerbaijan and its major trading partners, including Russia.

The relationship between foreign trade and economic growth has been widely examined in economic literature, both from theoretical and empirical perspectives. Classical and neoclassical growth theories emphasize the role of trade as a key driver of economic expansion through channels such as resource allocation efficiency, technology transfer, market enlargement, and productivity growth. In empirical research, econometric modeling has become a dominant approach for quantifying the impact of trade flows on macroeconomic performance.

Foundational econometric methodologies used in trade–growth studies are well documented in standard econometrics literature. Gujarati and Porter (2009) and Wooldridge (2016) provide comprehensive frameworks for regression analysis, hypothesis testing, and model diagnostics, which are extensively applied in empirical macroeconomic research. Enders (2015) highlights the importance of time-series techniques, particularly unit root and cointegration analysis, in avoiding spurious regression results in macroeconomic data. The problem of spurious regressions was initially identified by Granger and Newbold (1974), emphasizing the necessity of stationarity testing prior to regression estimation.

Unit root testing has become a standard prerequisite in time-series econometric studies. The Augmented Dickey-Fuller (ADF) test developed by Dickey and Fuller (1981) is widely used to assess the stationarity properties of economic variables such as GDP and trade turnover. Additionally, ensuring the reliability of regression estimates requires diagnostic testing for heteroskedasticity and model stability. White's (1980) heteroskedasticity-consistent covariance estimator and the Breusch–Pagan test (1979) are commonly employed to detect variance instability in regression residuals, while the CUSUM test proposed by Brown, Durbin, and Evans (1975) is used to evaluate the structural stability of econometric models over time.

Empirical studies focusing on Azerbaijan provide substantial evidence on the role of foreign trade in economic growth. Hasanov (2013) analyzes the structural characteristics of Azerbaijan's economy and highlights the vulnerability associated with resource dependence, emphasizing the importance of diversified trade relations. Ismayilov and Aliyev (2020) empirically confirm a positive relationship between foreign trade indicators and Azerbaijan's economic growth, supporting the trade-led growth hypothesis.

Several studies by Huseynova and co-authors contribute significantly to the econometric literature on Azerbaijan's trade relations. Huseynova (2020) and Mubariz (2020) investigate cointegration relationships between Azerbaijan's GDP and trade balances with major partner countries, including Russia and Belarus, demonstrating long-run equilibrium relationships. Huseynova (2023) further applies cointegration analysis to assess economic growth linkages between Azerbaijan and Russia, confirming strong interdependence between the two economies. These findings are reinforced by Huseynova (2022), who conducts a comparative econometric analysis of inclusive growth indicators across Azerbaijan, Russia, and Kazakhstan.

Studies examining specific trade mechanisms also provide relevant insights. Alirzayev and Huseynova (2025) test the J-curve effect and the Marshall–Lerner condition for Azerbaijan, highlighting the responsiveness of trade balances to exchange rate movements. Huseynova and Babazade analyze the elasticity of Azerbaijan's import–export operations with respect to exchange rate fluctuations and population income, emphasizing the sensitivity of trade flows to macroeconomic variables. Research on Azerbaijan's WTO accession process (Guseynova, 2014; Huseynova & Ch, 2019; Guliyev & Huseynova, 2016) underscores the strategic importance of external trade integration for sustainable economic growth.

Institutional and policy-oriented studies further contextualize trade–growth dynamics. Huseynova and Kazimov emphasize investment incentives as a tool for sustainable development, while Huseynova and Qurbanova (2025) analyze the role of state policy in regulating transport and logistics services to support foreign trade expansion. Recent work by Huseynova and Balajayeva (2025) extends the discussion to digital banking regulation, indirectly linking financial infrastructure development with trade facilitation and economic growth.

International data sources such as the World Bank (2024), IMF (2023), UNCTAD (2023), the State Statistical Committee of Azerbaijan, and the Central Bank of Azerbaijan provide reliable macroeconomic and trade statistics widely used in empirical analyses. These datasets enable long-term time-series modeling and comparative assessments of trade dynamics and economic performance.

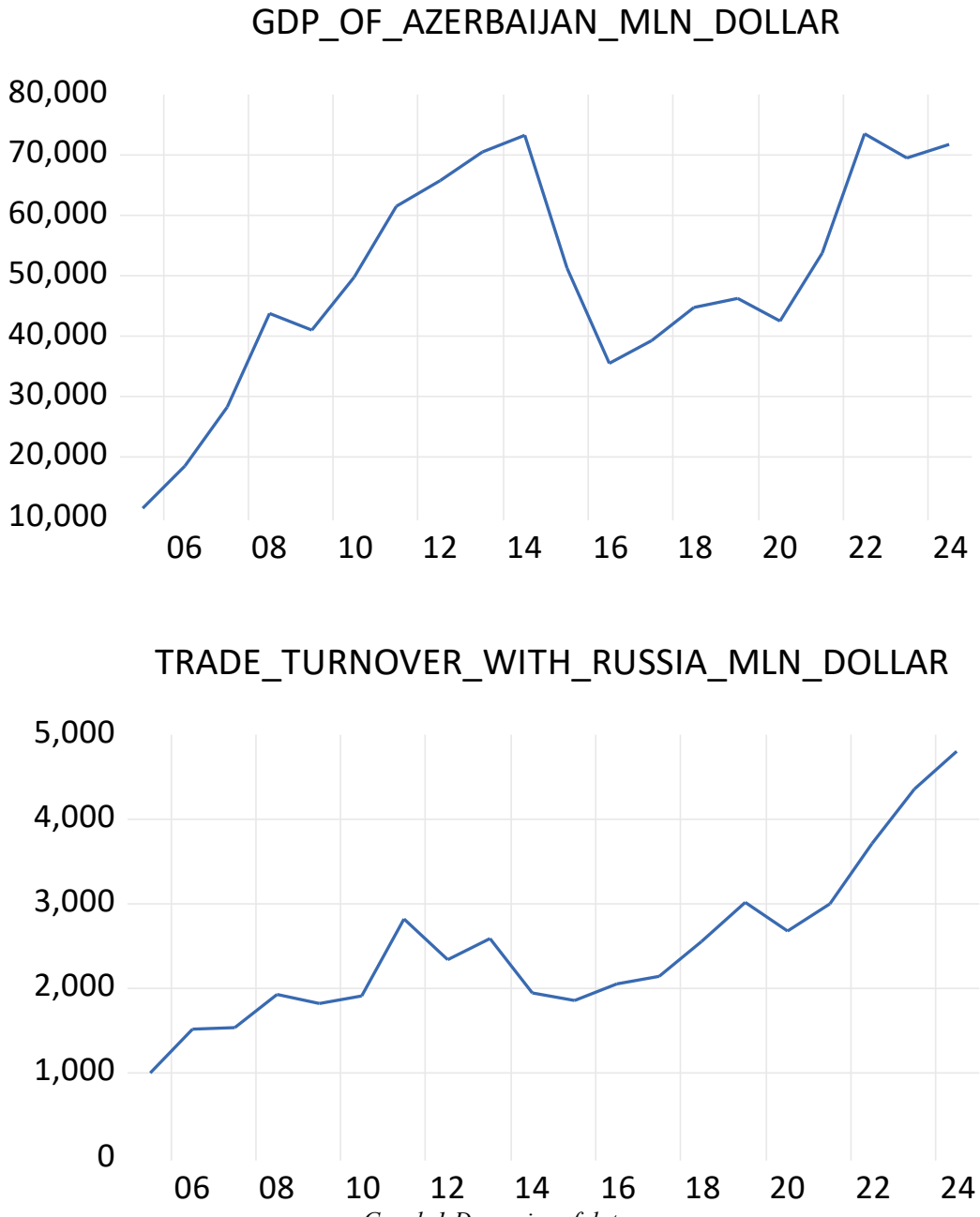
Overall, the existing literature confirms a strong theoretical and empirical link between foreign trade and economic growth in Azerbaijan. However, while numerous studies analyze trade openness and aggregate trade indicators, fewer focus specifically on bilateral trade turnover with Russia over an extended period. This study contributes to the literature by providing an updated econometric assessment of Azerbaijan–Russia

trade relations from 2005 to 2024, employing rigorous diagnostic testing to ensure model reliability and offering policy-relevant insights into the economic significance of this strategic partnership.

Empirical analysis and discussion.

Azerbaijan's GDP shows a strong upward trend from 2005 to 2008, largely driven by high oil revenues and rapid economic expansion. This growth continues more moderately until 2014, followed by a sharp decline in 2015–2016, which can be associated with the fall in global oil prices and macroeconomic adjustments. After 2017, GDP gradually recovers and increases significantly. In 2020,There was a decrease which was caused by COVID-19 and the second Karabakh war. After 2021, indicating renewed economic growth.

From 2005 to 2011, bilateral trade exhibits a consistent upward trend, driven by increasing economic integration, rising demand, and expanding trade volumes between Azerbaijan and Russia. Between 2012 and 2015, trade turnover shows noticeable fluctuations and a decline. This period aligns with economic difficulties in Russia and spillover effects on bilateral trade. From 2016 , trade turnover begins to recover gradually, with a particularly strong upward momentum after 2020. The sharp increase observed during 2022–2024. That sharp increase was possibly influenced by geopolitical realignments, supply chain redirection, and increased regional trade dependence.



Graph 1.Dynamics of data

That table shows the correlation between GDP and Trade turnover with Russia

	GDP_OF_...	TRADE_T...
GDP ...	1	0.70789338...
TRAD...	0.70789338...	1

Table 1. Correlation coefficient

So, the correlation between GDP and Trade turnover with Russia is 0.71, indicating a strong and positive relationship between the two variables. This suggests that increases in bilateral trade turnover with Russia are generally associated with higher levels of GDP in Azerbaijan. The positive correlation supports the hypothesis that trade relations with Russia play an important role in Azerbaijan's economic performance.

Here is Table 2 that shows descriptive statistics of data

Table 2.

Descriptive statistics

	GDP_OF_...	TRADE_T...
Mean	49595.21	2479.507
Median	48029.80	2239.685
Maximum	73522.60	4799.820
Minimum	11728.70	1002.640
Std. Dev.	18086.75	951.0972
Skewness	-0.356469	0.958028
Kurtosis	2.364161	3.451079
Jarque-Bera	0.760477	3.228953
Probability	0.683698	0.198995
Sum	991904.1	49590.14
Sum Sq. Dev.	6.22E+09	17187131
Observations	20	20

Basic statistical analysis was carried out to understand the characteristics of the data. Mean, median, minimum, maximum values and standard deviation were calculated. Values of Skewness of GDP and Trade Turnover equal correspondingly -0.356469 and 0.958028. According to values of skewness, GDP exhibits negative skewness(left-skewed), while Trade turnover exhibits positive skewness(right-skewed). Kurtosis of GDP and Trade Turnover with Russia equal relatively 2.364161 and 3.451079, it means that distribution of GDP and Trade Turnover with Russia is peakiness. Probability of Jarque-Bera value for GDP and Trade Turnover with Russia is more than 0.05, it means that time series accepted normal distribution.

A linear regression model was used to examine the effect of trade turnover with Russia on GDP. The linear regression equation equals:

$$DGDPt = \alpha + \beta \cdot DTRADEt + \varepsilon t$$

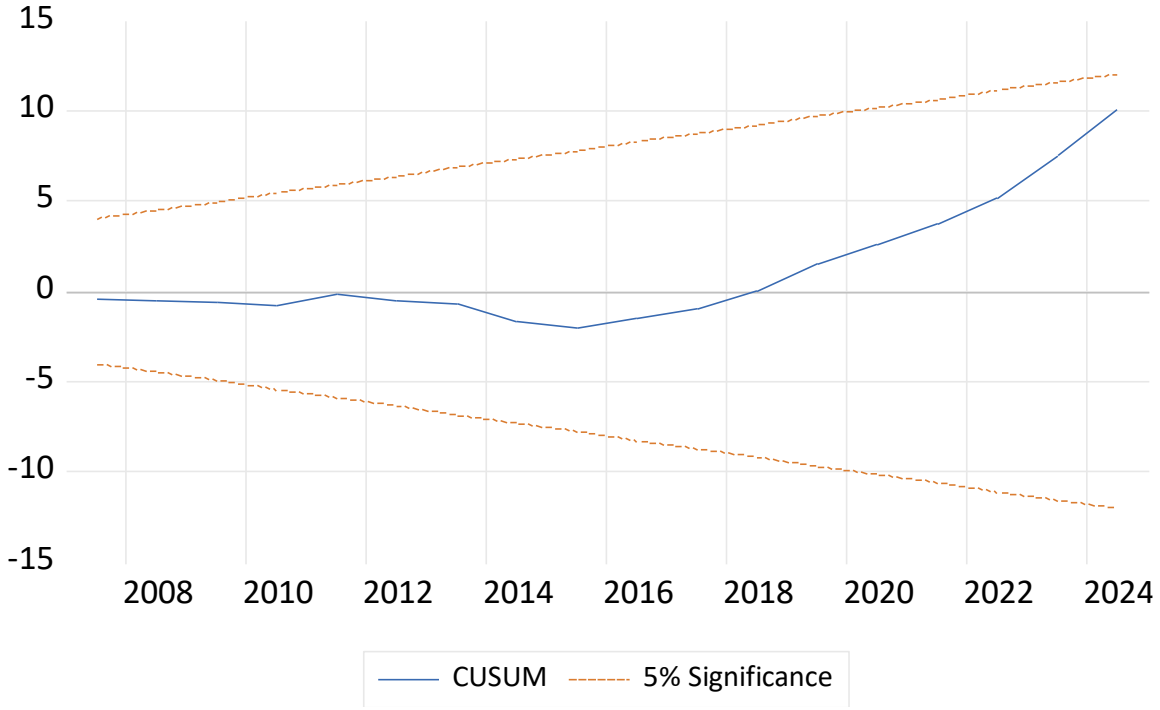
A linear regression model is shown on Table 3

Table3.

Regression model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP OF AZERBAIJAN MLN DOLLAR	0.037225	0.008754	4.252096	0.0005
C	633.3356	460.7922	1.374450	0.1862
R-squared	0.501113	Mean dependent var		2479.507
Adjusted R-squared	0.473397	S.D. dependent var		951.0972
S.E. of regression	690.1866	Akaike info criterion		16.00644
Sum squared resid	8574435.	Schwarz criterion		16.10601
Log likelihood	-158.0644	Hannan-Quinn criter.		16.02588
F-statistic	18.08032	Durbin-Watson stat		0.421753
Prob(F-statistic)	0.000479			

The regression results show a positive and statistically significant relationship between trade turnover and GDP. R-squared value of 0.50, indicating that about 50% of the variation in GDP is explained by trade turnover. Probability of T-statistic of Trade Turnover (approximately 0.0005) is less than 0.05. It means that regression model parameters are important. Probability of T-statistic of C (0.1862) is more than 0.05. It means that regression model parameters are unimportant. The Durbin-Watson statistic (0.42) indicated no serious autocorrelation problem.Stability of parametres is analyzed by CUSUM test.



Graph 2. CUSUM test

CUSUM test is defined stability or non-stability of coefficients (parameters) of linear regression model. In test, main line (blue line) of graph doesn't intersect with border lines, it means that regression model parameters are stable.

White test is defined homoscedasticity and heteroskedasticity of errors. F-statistic probability equals 0.0040. When F-statistic probability is more than 0.05, it means that regression model errors are heteroskedasticity.

Table 4.

White test

Heteroskedasticity Test: White
Null hypothesis: Homoskedasticity

F-statistic	7.776669	Prob. F(2,17)	0.0040
Obs*R-squared	9.555602	Prob. Chi-Square(2)	0.0084
Scaled explained SS	8.422224	Prob. Chi-Square(2)	0.0148

Breusch-Pagan-Godfrey is defined homos and hetros of errors. F-statistic probability equals 0.3265. When F-statistic probability is less than 0.05, it means that regression model errors are heteroskedasticity.

Table 5.

Breusch-Pagan-Godfrey test

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	10.90823	Prob. F(1,18)	0.0040
Obs*R-squared	7.546797	Prob. Chi-Square(1)	0.0060
Scaled explained SS	6.651681	Prob. Chi-Square(1)	0.0099

Time series analysis plays a central role in examining the dynamic behavior of economic and financial variables over time. In this study, time series techniques are applied to investigate the relationships between the selected variables and to identify both short-run and long-run dynamics. The analysis follows several systematic steps: data visualization, stationarity testing, model estimation, and diagnostic checking. These tables show the unit root test of time series.

Table 6,7.

Dickey-Fuller test

Null Hypothesis: D(GDP_OF_AZERBAIJAN_MLN_DOLLAR,2) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.203405	0.0009
Test critical values:	1% level	-3.920350	
	5% level	-3.065585	
	10% level	-2.673460	

Null Hypothesis: D(TRADE_TURNOVER_WITH_RUSSIA_MLN_DOLLAR,2) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.984572	0.0000
Test critical values:	1% level	-3.886751	
	5% level	-3.052169	
	10% level	-2.666593	

To avoid misleading results in time series analysis, the Augmented Dickey-Fuller (ADF) test was used to check whether the data series are stationary. Both GDP and trade turnover with Russia were found to be non-stationary at level but became stationary after taking the second difference. This means the variables are integrated of order one.

Conclusion.

This study empirically examined the impact of Azerbaijan's trade turnover with Russia on the country's economic growth over the period 2005–2024 using time-series econometric analysis. The descriptive results and dynamic trend evaluation showed that both GDP and bilateral trade experienced significant fluctuations associated with global oil prices, economic shocks, and geopolitical events. However, the long-term trend in trade turnover indicates an overall increase in economic cooperation between the two countries, especially after 2020.

Correlation analysis revealed a strong and positive association (0.71) between GDP and trade turnover, suggesting that higher trade volumes with Russia tend to accompany increases in economic output. Regression analysis further confirmed this relationship, indicating that trade turnover has a statistically significant effect on GDP, and approximately 50% of GDP variation can be explained by changes in trade turnover. Model stability was verified by the CUSUM test, while diagnostic analysis indicated heteroskedasticity in White test and Breusch-Pagan-Godfrey results, implying the need for robust estimation techniques in future research.

In general, the empirical findings support the conclusion that trade turnover with Russia plays an important role in Azerbaijan's economic performance and should remain a strategic component of external trade policy. Strengthening trade diversification, improving non-oil export capacity, and maintaining stable bilateral partnerships may further enhance sustainable growth.

Discussion and suggestions.

The empirical results of this research demonstrate that trade turnover between Azerbaijan and Russia is positively associated with Azerbaijan's economic growth. The regression analysis confirms the statistical significance of this relationship, while the correlation coefficient indicates a strong positive interaction between the two indicators. These findings align with previous literature emphasizing the role of international trade in fostering economic development through market expansion, access to resources, and integration into regional value chains.

Another relevant point is the heteroskedasticity presence detected in White test results, indicating that external shocks or fluctuations may affect model variance. This suggests the need for more comprehensive econometric models in future studies, including additional variables such as oil prices, exchange rate volatility, import composition, and foreign direct investment. Despite these limitations, the findings provide valuable insights into the economic importance of Azerbaijan-Russia trade dynamics.

They are my suggestions:

1) Diversification of export structure: Increasing non-oil exports to Russia, especially in agriculture, food industry, and light manufacturing sectors, may reduce dependence on oil income and create stable growth channels.

2) Promoting investment cooperation: Encouraging joint ventures and Russian capital inflows can stimulate industrial development and innovation capacity in Azerbaijan.

3) Reducing vulnerability to external shocks: Implementing economic diversification strategies and risk-management policies can help mitigate the effects of global crises and commodity price fluctuations.

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TIME SERIES ANALYSIS AND FORECASTING OF GROSS FIXED CAPITAL INVESTMENT IN AZERBAIJAN (2010-2024)

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Abstract

Understanding the dynamic behavior of gross fixed capital investment is essential for evaluating short-term fluctuations and designing effective investment policies in developing and resource-dependent economies. Using annual data for Azerbaijan over the period 2010-2024, this paper applies univariate time series econometric methods to analyze the stochastic properties and short-run dynamics of capital investment. Stationarity is assessed through the Augmented Dickey-Fuller unit root test, revealing that the investment series is non-stationary in levels but becomes stationary after first differencing, indicating an integration order of one. Autoregressive and moving average specifications are employed to capture persistence and innovation-driven dynamics. The results point to a notable degree of persistence in investment behavior, while innovation effects are found to play a significant role in short-run adjustments. Diagnostic tests based on correlogram analysis and Ljung-Box statistics confirm that the selected specification adequately captures temporal dependence, yielding white-noise residuals. Overall, the findings provide a statistically consistent representation of short-run investment dynamics and offer a reliable empirical basis for short-term forecasting and policy-oriented interpretation.

Keywords: Gross fixed capital investment; Time series analysis; Stationarity; ARMA models; Investment persistence; Short-run dynamics; Forecasting; Azerbaijan; Economic volatility

1. Introduction

Investment in fixed capital plays a central role in shaping long-term economic growth, structural transformation, and productivity dynamics in developing and resource-rich economies. Gross fixed capital investment reflects the scale of resources allocated to infrastructure, machinery, construction, and productive capacity, thereby serving as a key transmission channel between macroeconomic policy, private sector expectations, and real economic performance. For economies undergoing structural change and diversification, the dynamics of capital investment are particularly important, as fluctuations in investment activity can have persistent effects on output stability, employment creation, and long-term development trajectories.

In the case of Azerbaijan, gross fixed capital investment has been one of the main drivers of economic expansion over the past decades, closely linked to large-scale infrastructure projects, energy-related investments, and public capital expenditures. Since 2010, investment activity has exhibited noticeable fluctuations, reflecting both domestic policy shifts and external shocks, including changes in global energy prices, macroeconomic adjustments, and post-pandemic recovery dynamics. These developments underline the importance of understanding not only the level of investment but also its dynamic behavior over time, especially in terms of persistence, adjustment mechanisms, and short-run volatility.

Despite the macroeconomic importance of capital investment in Azerbaijan, much of the existing literature has focused on its determinants, sectoral composition, or long-run growth effects, often relying on cross-sectional or panel-based approaches. Comparatively less attention has been paid to the time series properties and short-run dynamics of aggregate gross fixed capital investment. In particular, questions regarding the stochastic nature of investment flows, the degree of persistence following shocks, and the adequacy of short-term forecasting models remain insufficiently explored. Ignoring these dynamic features may lead to model misspecification, spurious inference, and unreliable forecasts, especially when investment series exhibit non-stationarity or strong inertia.

From an econometric perspective, time series analysis provides a structured framework for addressing these issues. Examining stationarity properties, identifying appropriate dynamic specifications, and validating models through diagnostic tests are essential steps for ensuring that empirical results are statistically credible and policy-relevant. In this context, univariate time series methods-such as unit root testing, autoregressive and moving average modeling, and residual diagnostics-offer valuable insights into the short-run behavior of investment series without imposing restrictive structural assumptions.

Against this background, the present study conducts a comprehensive time series analysis of gross fixed capital investment in Azerbaijan using annual data for the period 2010-2024. The analysis focuses on three interrelated objectives: first, to determine the order of integration and stochastic properties of the investment series; second, to examine its short-run dynamic structure and persistence characteristics; and third, to assess the statistical adequacy of alternative time series specifications for forecasting purposes. By systematically combining unit root testing, ARMA-based modeling, and residual diagnostic evaluation, the study aims to provide a coherent and empirically robust representation of investment dynamics.

1.1. Problem Statement

Although gross fixed capital investment constitutes a key pillar of Azerbaijan's economic development, there is a lack of empirical evidence on its short-run time series behavior and forecasting characteristics.

Specifically, it remains unclear whether investment dynamics are primarily driven by persistent autoregressive behavior or by innovation-based shocks, and whether standard time series models adequately capture these dynamics without leaving systematic patterns in the residuals. Addressing this gap is essential for improving the reliability of short-term investment forecasts and for enhancing the empirical foundation of policy-oriented investment analysis.

2. Literature Review

The dynamic behavior of investment has long occupied a central position in empirical macroeconomic research, particularly due to its close relationship with economic growth, business cycles, and structural transformation. Gross fixed capital investment is widely recognized as one of the most volatile components of aggregate demand, often exhibiting pronounced persistence, nonlinearity, and sensitivity to economic shocks. These characteristics have motivated a substantial body of literature that applies time series econometric techniques to examine the stochastic properties and short-run dynamics of investment series.

A major turning point in the empirical analysis of macroeconomic time series was the recognition that many aggregate variables exhibit non-stationary behavior. Nelson and Plosser demonstrated that key macroeconomic indicators often follow unit root processes, implying that shocks may have permanent effects rather than dissipating over time. This insight fundamentally altered empirical modeling practices and underscored the necessity of testing for stationarity before estimating dynamic models. Subsequent methodological contributions, particularly the work of Dickey and Fuller, formalized statistical procedures for detecting unit roots, laying the foundation for modern time series analysis in macroeconomics.

Building on these methodological advances, numerous studies have examined the time series properties of investment. Empirical evidence across both developed and emerging economies suggests that gross fixed capital investment is typically integrated of order one, becoming stationary only after first differencing. This finding has important implications for model specification, as regressions conducted on non-stationary investment series may lead to spurious results and misleading inference. As a consequence, unit root testing has become a standard preliminary step in empirical investment studies.

Beyond stationarity, the literature has devoted considerable attention to the dynamic structure of investment series. Autoregressive (AR) and moving average (MA) models have been widely employed to capture persistence and shock transmission mechanisms. Studies such as those by Hamilton emphasize that autoregressive components often reflect institutional rigidities, adjustment costs, and gradual responses to policy changes, while moving average components capture the short-run impact of unexpected shocks. The relative importance of these dynamics varies across countries and time periods, reinforcing the need for context-specific empirical analysis.

Forecasting investment using time series models constitutes another important strand of the literature. Box and Jenkins popularized the ARIMA framework as a flexible and systematic approach to modeling and forecasting economic time series. Subsequent applications have demonstrated that well-specified ARMA/ARIMA models can outperform naïve forecasting methods, particularly when the underlying series exhibits stable short-run dynamics. However, the literature also cautions that small samples and overparameterization can compromise forecast accuracy, highlighting the importance of parsimonious model selection and rigorous diagnostic testing.

Diagnostic evaluation occupies a central role in time series modeling. Residual autocorrelation tests, such as the Ljung-Box Q-statistic, are widely used to assess whether a model has adequately captured the systematic temporal dependence in the data. Empirical studies consistently emphasize that coefficient significance alone is insufficient to establish model adequacy; instead, residuals must exhibit white-noise behavior for forecasts and inference to be considered reliable. This diagnostic-oriented approach has become a defining feature of modern applied time series analysis.

In recent years, the application of time series methods to investment dynamics in emerging and resource-dependent economies has gained increasing attention. These studies highlight that investment series in such economies often display heightened volatility and strong persistence due to exposure to external shocks, commodity price fluctuations, and policy-driven investment cycles. Consequently, the literature underscores the importance of carefully examining short-run dynamics and diagnostic properties rather than relying solely on long-run growth relationships.

While these stylized facts are well established in the global literature, their empirical relevance may vary significantly across countries depending on institutional structures, investment regimes, and development strategies. In economies where capital accumulation is closely driven by public investment programs and large-scale infrastructure projects, investment dynamics may exhibit stronger persistence and more pronounced short-run fluctuations. This makes country-specific time series analysis particularly important for understanding how global empirical regularities manifest in national investment behavior.

Empirical studies on Azerbaijan's economic development consistently emphasize the central role of gross fixed capital investment in shaping infrastructure expansion and macroeconomic stability. Local research highlights that capital investment dynamics in Azerbaijan are closely linked to state-led development strategies, large-scale infrastructure projects, and regional development priorities. These characteristics suggest that investment behavior is inherently dynamic and subject to persistence rather than instantaneous adjustment (Hasanov, 2018; Mammadov & Aliyev, 2020).

A significant strand of the literature focuses on infrastructure-driven investment growth. Zəkizadə (2023) demonstrates that innovative industrial infrastructure development in the Karabakh and East-Zangezur economic regions follows a phased investment pattern, implying delayed adjustment and persistence in capital flows. Complementing this view, Zəkizadə (2024a) argues that the formation of innovative industrial infrastructure in post-conflict regions

introduces new cyclical dynamics into national investment statistics, reinforcing the relevance of short-run dynamic analysis.

Other studies broaden the perspective by linking investment behavior to institutional and policy-driven mechanisms. Zəkizadə (2024b) emphasizes that infrastructure investments play a critical role in transmitting development policy objectives into real economic outcomes in Azerbaijan, particularly through capital accumulation and regional connectivity. Similarly, Aliyev and Rzayev (2021) underline that ignoring dynamic properties and non-stationarity in investment series may lead to biased empirical conclusions, especially in economies with strong public investment cycles.

Recent literature increasingly addresses post-conflict reconstruction and sustainable infrastructure development. Zakizade (2025a) highlights that investment flows in the post-conflict period are characterized by heightened sensitivity to funding schedules and implementation stages, which can amplify short-run volatility in aggregate capital investment. In a related contribution, Zakizade and Gubadzadeh (2025) argue that improving infrastructure management frameworks is essential for stabilizing investment dynamics across economic regions, suggesting that governance factors may indirectly affect investment persistence.

Historical and sectoral perspectives further enrich the local evidence. Zəkizadə (2023b) provides a historical analysis of infrastructure development in Azerbaijan, emphasizing the long-term role of strategic leadership in shaping capital investment trajectories. Meanwhile, Zəkizadə (2025b) examines innovative light-industry infrastructure formation in liberated territories and notes that investment processes in such contexts tend to follow non-linear paths, with strong short-run fluctuations before stabilization.

Finally, sector-specific analyses underline that investment dynamics vary across economic activities but share common adjustment patterns. Zekizade (2023c) shows that agricultural infrastructure development in Karabakh and Eastern Zangezur exhibits delayed responses to policy interventions, indicating persistence and gradual adjustment in capital allocation. Together, these findings suggest that Azerbaijan's gross fixed capital investment is shaped by a combination of policy-driven inertia, innovation cycles, and region-specific factors, yet remains insufficiently explored through formal time series modeling and forecasting frameworks. All forecasts are generated using the stationary ARIMA representation to avoid spurious trend extrapolation.

Overall, while the local literature provides rich qualitative and sectoral insights into the determinants and strategic importance of investment in Azerbaijan, there remains a notable gap in studies that systematically examine the short-run time series dynamics, persistence, and forecasting performance of aggregate gross fixed capital investment. Addressing this gap through rigorous unit root testing, dynamic modeling, and diagnostic validation constitutes the primary contribution of the present study.

3. Methodology

This study is based on annual time series data on gross fixed capital investment in Azerbaijan covering the period 2010-2024. The data represent the total volume of investments directed to fixed capital and are expressed in nominal terms as officially reported by national statistical sources. Given the annual frequency and relatively short sample size, particular attention is paid to model parsimony and diagnostic adequacy in order to avoid overparameterization and unreliable inference.

For econometric analysis, the investment series is transformed into its natural logarithmic form (denoted as LQ) to stabilize variance and facilitate interpretation of dynamic relationships. Logarithmic transformation is commonly applied in time series analysis of macroeconomic variables, as it reduces scale effects and allows estimated coefficients to be interpreted in relative terms. The first difference of the logged series, denoted as DLQ, represents the growth dynamics of gross fixed capital investment and is used when stationarity in levels is not supported.

3.1. Stationarity Testing

A fundamental requirement for time series modeling is that the underlying variables are stationary or appropriately transformed to achieve stationarity. Non-stationary series may lead to spurious regression results and invalid statistical inference. To assess the stationarity properties of the investment series, the Augmented Dickey-Fuller (ADF) unit root test is applied.

The ADF test is first conducted on the level series (LQ) under a specification that includes an intercept but excludes a deterministic time trend. This specification is appropriate when the series is expected to fluctuate around a non-zero mean without exhibiting a clear linear trend. The optimal lag length is selected automatically using the Schwarz Information Criterion (SIC) to ensure the elimination of residual serial correlation.

Given the small sample size and the borderline nature of the level test results, the analysis proceeds by applying the ADF test to the first-differenced series (DLQ). In this case, no deterministic components are included in the test equation, as the differenced series is theoretically expected to oscillate around a zero mean. The combination of level and differenced ADF results allows for a robust determination of the order of integration of the investment series.

3.2. Dynamic Model Specification

After establishing the stationarity properties of the data, the short-run dynamics of gross fixed capital investment are examined using univariate time series models. Specifically, autoregressive (AR) and moving average (MA) specifications are employed to capture persistence and shock transmission mechanisms. Although the investment series is identified as integrated of order one, preliminary AR and MA specifications in levels are estimated strictly as descriptive benchmarks to illustrate persistence and innovation effects. These level-based models are not used for inference or forecasting, which are instead conducted within a properly differenced or ARIMA framework.

As a preliminary descriptive benchmark, an AR(1) model is estimated for the level series (LQ) to illustrate the degree of persistence and inertia in investment behavior. The autoregressive coefficient provides insight into how strongly current investment levels depend on

past realizations, offering an intuitive interpretation of short-run adjustment patterns.

To complement the autoregressive analysis, a MA(1) model is estimated for the level series in order to assess the role of innovation-driven dynamics. The moving average specification captures how current investment outcomes are influenced by past shocks rather than lagged levels, allowing for a comparative evaluation of persistence versus shock-based adjustment mechanisms.

3.3. ARIMA Model Identification and Selection

Following the identification of the investment series as integrated of order one, ARIMA models are estimated on the first-differenced series. Alternative ARIMA(p,1,q) specifications are compared using the Akaike Information Criterion (AIC) and Schwarz Information Criterion (SIC). The preferred model is selected based on minimum information criteria values and residual diagnostic adequacy. Among the estimated specifications, the ARIMA(1,1,0) model is selected as the preferred specification, as it minimizes both AIC and SIC and yields diagnostically well-behaved residuals.

3.4. Model Diagnostics and Adequacy Testing

Coefficient significance and in-sample fit are not sufficient criteria for evaluating the adequacy of a time series model. A well-specified model must also satisfy key diagnostic conditions, most importantly that its residuals behave as white noise. Residual autocorrelation indicates that relevant dynamics remain unmodeled, undermining both inference and forecasting reliability.

To assess model adequacy, residual diagnostics are conducted using correlogram analysis and the Ljung-Box Q-statistic. The correlogram provides a visual inspection of autocorrelation and partial autocorrelation patterns across multiple lags, while the Ljung-Box test formally evaluates the joint null hypothesis that residual autocorrelations up to a given lag are simultaneously equal to zero. The Q-statistics are adjusted for the number of estimated ARMA terms to ensure correct inference.

Only models whose residuals exhibit no statistically significant autocorrelation are considered adequate for forecasting purposes. This diagnostic-driven approach ensures that the selected specification captures the systematic temporal dependence in the data and that remaining disturbances represent purely random innovations.

3.5. Forecasting Framework

Based on the established stationarity properties and diagnostic validation, short-run forecasts of gross fixed capital investment are generated using the selected time series specification. Forecasting is conducted on the stationary representation of the data to avoid spurious trend extrapolation. The focus is placed on short-term forecasting performance, given the annual frequency and limited sample size.

Forecast evaluation emphasizes statistical consistency rather than long-horizon accuracy, as small samples inherently limit predictive precision. The forecasting exercise is therefore interpreted as an extension of the dynamic analysis, illustrating how the estimated short-run relationships translate into expected future investment behavior under unchanged structural conditions.

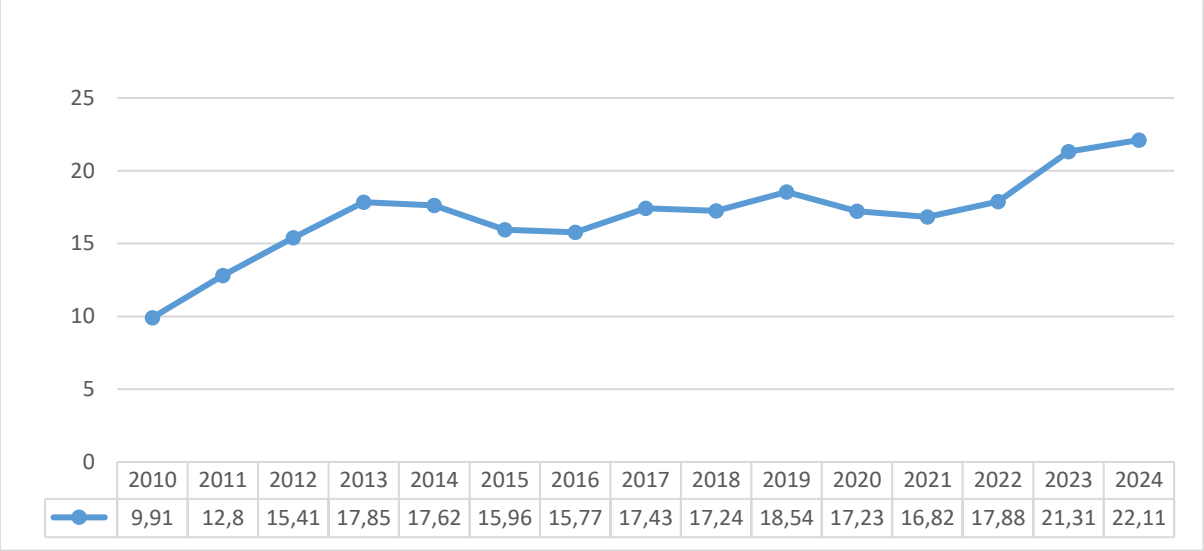
3.6. Methodological Limitations

Several limitations should be acknowledged. First, the use of annual data restricts the number of observations and reduces the power of statistical tests. Second, the univariate framework does not explicitly incorporate potential explanatory variables such as output growth, fiscal policy indicators, or external shocks. Finally, structural breaks and regime changes are not modeled explicitly, which may affect investment dynamics in periods of major economic or geopolitical shifts.

Despite these limitations, the adopted methodology provides a coherent and statistically rigorous framework for analyzing the short-run dynamics and forecasting behavior of gross fixed capital investment in Azerbaijan. By combining unit root testing, dynamic modeling, and diagnostic validation, the study ensures that empirical results are both methodologically sound and policy-relevant.

4. Data Description and Stylized Facts

Before proceeding to the formal econometric analysis, it is essential to provide a descriptive overview of the gross fixed capital investment data used in the study. Visual inspection of the time series allows for an initial assessment of long-term trends, cyclical movements, and potential structural changes that may influence the stochastic properties of the series. Such preliminary examination plays a crucial role in guiding subsequent modeling decisions, particularly with respect to stationarity testing, differencing requirements, and the choice of appropriate dynamic specifications.



Graph 1. Gross Fixed Capital Investment in Azerbaijan (2010-2024, billion manats)
Source: *Compiled by the author based on data from the State Statistical Committee of the Republic of Azerbaijan (SSCRA).*

The graph illustrates the dynamics of gross fixed capital investment in Azerbaijan over the period 2010-2024, measured in billion manats at current prices. Overall, the investment trajectory exhibits a clear upward long-term trend, indicating a steady expansion of capital formation in the economy. From 2010 to 2013, investments increased rapidly, reflecting a phase of intensive capital accumulation. This growth was followed by a period of relative stagnation and moderate decline during 2014-2016, suggesting a temporary adjustment in investment activity.

From 2017 onward, investment levels recovered and displayed moderate fluctuations, with a noticeable increase around 2019. A brief contraction is observed in 2020-2021, which may be associated with external shocks and macroeconomic uncertainty. However, the subsequent years show a strong rebound, with investments reaching their highest levels in 2023-2024. The presence of cyclical movements around an upward trend indicates that investment activity is influenced by both structural factors and short-term shocks. These observed dynamics underline the importance of a formal time-series analysis to assess stationarity, persistence, and the nature of short- and long-run adjustments, which is addressed in the following empirical section.

5. Empirical Analysis - Introductory Remarks

The empirical analysis aims to examine the dynamic behavior of gross fixed capital investment in Azerbaijan by focusing on its time-series properties and short-run adjustment patterns. Understanding the statistical nature of the investment series is a prerequisite for reliable dynamic modeling and forecasting, as non-stationarity and persistence may distort empirical inference if not properly addressed. Therefore, the analysis begins by investigating whether the investment series exhibits unit root behavior or converges toward a stable stochastic process over time.

As a first step, the stationarity properties of the logarithm of gross fixed capital investment (LQ) are tested using the Augmented Dickey-Fuller (ADF) unit root test. This initial test provides the foundation for all subsequent empirical modeling by determining the appropriate transformation of the data and guiding the specification of dynamic models. The results reported below represent the starting point of the empirical investigation and establish the statistical conditions under which the remaining analyses are conducted.

	A	B	C	D	E
1	Null Hypothesis: LQ has a unit root				
2	Exogenous: Constant				
3	Lag Length: 0 (Automatic - based on SIC, maxlag=3)				
4					
5				t-Statistic	Prob.*
6					
7	Augmented Dickey-Fuller test statistic			-3.345975	0.0325
8	Test critical values:	1% level		-4.004425	
9		5% level		-3.098896	
10		10% level		-2.690439	
11					
12	*MacKinnon (1996) one-sided p-values.				
13	Warning: Probabilities and critical values calculated for 20 observations				
14	and may not be accurate for a sample size of 14				
15					
16					
17	Augmented Dickey-Fuller Test Equation				
18	Dependent Variable: D(LQ)				
19	Method: Least Squares				
20	Date: 01/14/26 Time: 08:39				
21	Sample (adjusted): 2011 2024				
22	Included observations: 14 after adjustments				
23					
24	Variable	Coefficient	Std. Error	t-Statistic	Prob.
25					
26	LQ(-1)	-0.398839	0.119200	-3.345975	0.0058
27	C	6.681223	1.979769	3.374749	0.0055
28					
29	R-squared	0.482659	Mean dependent var		0.057340
30	Adjusted R-squared	0.439548	S.D. dependent var		0.104915
31	S.E. of regression	0.078543	Akaike info criterion		-2.118774
32	Sum squared resid	0.074028	Schwarz criterion		-2.027480
33	Log likelihood	16.83142	Hannan-Quinn criter.		-2.127225
34	F-statistic	11.19555	Durbin-Watson stat		1.211570
35	Prob(F-statistic)	0.005823			
36					

Figure 1. Augmented Dickey-Fuller (ADF) unit root test results for gross fixed capital investment (LQ)
Source: *The model is compiled by the author based on data from the SSCRA*

The stationarity properties of the LQ series were initially examined using the Augmented Dickey-Fuller (ADF) unit root test under a specification that includes an intercept (constant) but excludes a deterministic time trend. This specification is appropriate when the series is expected to fluctuate around a non-zero mean without exhibiting a clear linear trend over time. The optimal lag length was selected automatically based on the Schwarz Information Criterion (SIC), resulting in a lag order of zero. In practical terms, this implies that the test equation does not require additional lagged difference terms to remove residual serial correlation, and the unit-root decision is driven primarily by the behavior of the level series itself.

The reported ADF test statistic for LQ equals -3.346, with an associated MacKinnon one-sided p-value of 0.0325. When benchmarked against the conventional critical values, the test statistic is more negative than the 5% critical value (-3.099), while remaining slightly less negative than the 1% critical value (-4.004). This pattern indicates that, under standard asymptotic assumptions, the null hypothesis of a unit root can be rejected at the 5% significance level, suggesting that LQ may be stationary in levels (i.e., integrated of order zero, I(0)). Economically, such a finding would imply mean-reverting dynamics: deviations of LQ from its long-run average would tend to be corrected over time rather than persisting indefinitely.

Given the small sample size and the sensitivity of unit root tests, this evidence is not considered sufficient to treat the series as I(0). Therefore, the order of integration is determined primarily based on the strong stationarity of the first-differenced series.

However, the reliability of this inference must be interpreted with caution due to the very small effective sample size (only 14 observations after adjustments). EViews explicitly warns that the computed probabilities and critical values may be inaccurate in such a short sample. In small samples, unit root tests are known to have limited power and may yield borderline rejections that are not robust to alternative lag structures, deterministic specifications (constant versus trend), or minor data revisions. Therefore, although the p-value is below 0.05, the evidence against a unit root at the level form should be characterized as moderate rather than definitive.

The estimated test equation further provides an economically meaningful adjustment signal. The coefficient on the lagged level term, LQ(-1), is negative (approximately -0.399) and statistically significant, which is consistent with a stabilizing correction mechanism: when LQ is high relative to its mean, subsequent movements tend to offset this deviation. At the same time,

because the inference is based on a short sample and a lag order of zero, it is methodologically prudent to validate the order of integration by testing the first-differenced series as well. If the differenced series is strongly stationary (typically with a much lower p-value), the overall evidence would support treating LQ as I(1) and proceeding with ARMA/ARIMA modeling on differences (or with cointegration/VECM frameworks if multivariate relationships are studied).

In summary, the ADF test on LQ in levels provides weak-to-moderate statistical evidence against the unit root hypothesis at the 5% level under an intercept-only specification. Nonetheless, given the short sample and the sensitivity of unit root testing in small datasets, the analysis should be complemented with stationarity tests on the first difference (DLQ) and, if necessary, additional robustness checks. This staged approach ensures that the subsequent forecasting models (AR/MA/ARIMA) are built on an appropriately stationary representation of the series and that model-based inference remains statistically credible.

Despite the weak-to-moderate evidence against the unit root hypothesis obtained for the level series, the reliability of this result is constrained by the small sample size and the sensitivity of unit root tests under such conditions. To ensure a robust identification of the stochastic properties of the series and to avoid potential model misspecification, the analysis proceeds by examining the stationarity of the first-differenced series. Testing the differenced form provides a clearer basis for determining the true order of integration of LQ and serves as a necessary step before estimating short-run dynamic models and conducting forecasting analysis.

	A	B	C	D	E
1	Null Hypothesis: DLQ has a unit root				
2	Exogenous: None				
3	Lag Length: 0 (Automatic - based on SIC, maxlag=2)				
4					
5				t-Statistic	Prob.*
6					
7	Augmented Dickey-Fuller test statistic			-2.824482	0.0086
8	Test critical values:	1% level		-2.754993	
9		5% level		-1.970978	
10		10% level		-1.603693	
11					
12	*MacKinnon (1996) one-sided p-values.				
13	Warning: Probabilities and critical values calculated for 20 observations				
14	and may not be accurate for a sample size of 13				
15					
16					
17	Augmented Dickey-Fuller Test Equation				
18	Dependent Variable: D(DLQ)				
19	Method: Least Squares				
20	Date: 01/14/26 Time: 08:42				
21	Sample (adjusted): 2012 2024				
22	Included observations: 13 after adjustments				
23					
24	Variable	Coefficient	Std. Error	t-Statistic	Prob.
25					
26	DLQ(-1)	-0.549881	0.194684	-2.824482	0.0153
27					
28	R-squared	0.383238	Mean dependent var		-0.016893
29	Adjusted R-squared	0.383238	S.D. dependent var		0.107423
30	S.E. of regression	0.084364	Akaike info criterion		-2.033560
31	Sum squared resid	0.085406	Schwarz criterion		-1.990102
32	Log likelihood	14.21814	Hannan-Quinn criter.		-2.042492
33	Durbin-Watson stat	2.086276			
34					

Figure 2. Augmented Dickey-Fuller (ADF) unit root test results for the first-differenced series (DLQ)
Source: *The model is compiled by the author based on data from the SSCRA*

The Augmented Dickey-Fuller (ADF) test was applied to the first difference of the LQ series (DLQ) to verify whether differencing successfully eliminates the non-stationary behavior observed in levels. In contrast to the level specification, the test equation for DLQ was estimated without deterministic components, as the differenced series is theoretically expected to fluctuate around a zero mean rather than a constant or deterministic trend. The optimal lag length was automatically selected based on the Schwarz Information Criterion (SIC), resulting in a lag order of zero, which suggests

that serial correlation in the residuals does not pose a concern for the test's validity.

The estimated ADF test statistic for DLQ is -2.824, with an associated MacKinnon one-sided p-value of 0.0086. This value is substantially below conventional significance thresholds, allowing the null hypothesis of a unit root to be rejected even at the 1% significance level. Compared to the borderline and sample-sensitive result obtained for the level series, this outcome provides strong and unambiguous statistical evidence that the first-differenced series is stationary. From an econometric standpoint, this finding confirms that first differencing is both necessary and sufficient to stabilize the series.

Additional insight is obtained from the estimated test equation itself. The coefficient on the lagged difference term, DLQ(-1), is negative and statistically significant, indicating the presence of a rapid short-run adjustment mechanism. This implies that shocks affecting the growth dynamics of LQ are short-lived and tend to dissipate quickly rather than propagating over time. Consequently, innovations in the differenced series do not generate persistent deviations, reinforcing the conclusion that DLQ follows a stable stochastic process.

Taken together, the contrasting results between the level and differenced specifications clearly indicate that LQ is integrated of order one, I(1). While the level series exhibits weak mean-reverting tendencies under restrictive conditions, only the differenced series demonstrates robust stationarity. This distinction is crucial for subsequent modeling decisions, as applying autoregressive or moving-average structures directly to the non-stationary level series could lead to spurious inference. By contrast, modeling DLQ ensures that parameter estimates are statistically valid and that forecast dynamics reflect genuine short-run relationships rather than artificial trends.

In methodological terms, the confirmation of DLQ's stationarity provides a solid foundation for the next stage of the analysis. It justifies the use of ARMA- or ARIMA-based frameworks to capture short-run dynamics and supports the implementation of forecast exercises based on a properly stationary representation of the data. Thus, the ADF results for DLQ play a pivotal role in linking the preliminary unit

Having established that the first-differenced series (DLQ) is strongly stationary, the next step is to explore the short-run dynamic behavior of the underlying level series and the degree of persistence it exhibits over time. Although the core forecasting framework should ultimately rely on a stationary representation (i.e., differences or appropriately specified ARIMA structures), estimating a simple autoregressive specification in levels can still serve as a useful descriptive benchmark. This preliminary exercise helps quantify how strongly current values of LQ depend on their own past realizations and provides an intuitive interpretation of persistence before moving to the full forecasting and diagnostic stage.

	A	B	C	D	E
1	Dependent Variable: LQ				
2	Method: Least Squares				
3	Date: 01/14/26 Time: 08:53				
4	Sample (adjusted): 2011 2024				
5	Included observations: 14 after adjustments				
6	Convergence achieved after 3 iterations				
7					
8	Variable	Coefficient	Std. Error	t-Statistic	Prob.
9					
10	C	16.75168	0.067943	246.5557	0.0000
11	AR(1)	0.601161	0.119200	5.043312	0.0003
12					
13	R-squared	0.679444	Mean dependent var		16.66525
14	Adjusted R-squared	0.652731	S.D. dependent var		0.133283
15	S.E. of regression	0.078543	Akaike info criterion		-2.118774
16	Sum squared resid	0.074028	Schwarz criterion		-2.027480
17	Log likelihood	16.83142	Hannan-Quinn criter.		-2.127225
18	F-statistic	25.43500	Durbin-Watson stat		1.211570
19	Prob(F-statistic)	0.000288			
20					
21	Inverted AR Roots	.60			
22					

Figure 3. Autoregressive model estimation results for LQ: AR(1) specification (levels)
Source: *The model is compiled by the author based on data from the SSCRA*

Figure 3 reports the estimation results of a first-order autoregressive model for the level series LQ, where the current value of LQ is explained by a constant term and its one-period lag. This AR(1) specification is frequently used as a baseline representation of persistence in macroeconomic and financial time series, because it summarizes dynamic dependence with a single autoregressive coefficient. In this context, the model is interpreted primarily as a descriptive benchmark that illustrates the extent to which shocks to LQ carry over to subsequent periods.

The estimated autoregressive coefficient is AR(1) = 0.601 and is statistically significant ($p = 0.0003$). This magnitude indicates a moderate-to-strong persistence pattern: changes in LQ do not fully dissipate within a single period, and a sizeable fraction of past deviations continues to influence current outcomes. Substantively, this means that once LQ experiences an increase (or decrease), the series tends to remain above (or below) its previous level for some time rather than immediately returning to a baseline. Such behavior is consistent with inertia mechanisms often observed in economic indicators, where adjustment processes, institutional rigidities, or gradual responses to information and policy contribute to persistence.

The stationarity condition for the AR process is supported by the reported inverted AR root (0.60), which lies strictly within the unit circle. From a purely autoregressive perspective, this implies that the process is dynamically stable and that the effect of a one-time shock decays over time at a geometric rate. In practical terms, the speed of decay implied by an AR(1) coefficient around 0.60 suggests that the impact of shocks diminishes relatively gradually: the series adjusts, but not instantaneously. This is an important qualitative insight for forecasting, because persistent series typically require models that adequately capture inertia; otherwise, forecasts may systematically under- or over-react to new information.

The model fit indicators also point to a strong explanatory contribution of the lag structure within this simple framework. The reported R-squared is approximately 0.68, implying that the AR(1) component accounts for a considerable share of the variation in LQ within the sample. The overall model is statistically significant as well (Prob(F-statistic) ≈ 0.000288), which reinforces the conclusion that lagged values contain meaningful predictive content for current LQ. However, it is crucial to interpret these goodness-of-fit measures cautiously, particularly given the small effective sample size and the risk that persistence in levels may mechanically inflate explanatory power.

From a diagnostic perspective, the Durbin-Watson statistic (≈ 1.21) signals potential residual autocorrelation. This finding is not uncommon in parsimonious AR(1) specifications and suggests that a single autoregressive lag may not fully capture the dependence structure of the series. Consequently, more flexible ARMA/ARIMA formulations (and subsequent residual diagnostics) remain necessary for a statistically reliable forecasting model. In other words, Figure 3 provides valuable evidence of persistence, but it should not be treated as the final forecasting specification without further refinement and diagnostic validation.

Overall, the AR(1) estimation in Figure 3 indicates that LQ exhibits substantial inertia, with a statistically significant autoregressive component and dynamically stable behavior. This result supports the broader modeling strategy by motivating the use of time-series models that explicitly account for persistence. At the same time, given the stationarity evidence established for DLQ and the small-sample environment, the AR(1) specification should be viewed as a preliminary benchmark rather than a definitive model, and it should be complemented by ARMA/ARIMA estimation and thorough diagnostic checks in the subsequent sections.

While the AR(1) specification provides a useful benchmark for quantifying persistence through lagged levels, it does not explicitly model the role of unanticipated shocks and the way they propagate through the series. In many economic time series, short-run fluctuations are driven not only by autoregressive inertia but also by the structure of innovations (disturbances) themselves. Therefore, to complement the autoregressive benchmark and to assess whether the dynamics of LQ are better characterized by shock-driven adjustment, a moving-average specification is considered in the next step.

	A	B	C	D	E
1	Dependent Variable: LQ				
2	Method: Least Squares				
3	Date: 01/14/26 Time: 08:57				
4	Sample: 2010 2024				
5	Included observations: 15				
6	Failure to improve SSR after 13 iterations				
7	MA Backcast: 2009				
8					
9	Variable	Coefficient	Std. Error	t-Statistic	Prob.
10					
11	C	16.66831	0.041329	403.3087	0.0000
12	MA(1)	0.999834	0.159102	6.284247	0.0000
13					
14	R-squared	0.734364	Mean dependent var		16.62815
15	Adjusted R-squared	0.713930	S.D. dependent var		0.192748
16	S.E. of regression	0.103092	Akaike info criterion		-1.582819
17	Sum squared resid	0.138164	Schwarz criterion		-1.488412
18	Log likelihood	13.87114	Hannan-Quinn criter.		-1.583825
19	F-statistic	35.93911	Durbin-Watson stat		1.886187
20	Prob(F-statistic)	0.000045			
21					
22	Inverted MA Roots	-1.00			
23					

Figure 4. Moving Average model estimation results for LQ: MA(1) specification (levels)
Source: *The model is compiled by the author based on data from the SSCRA*

Figure 4 presents the estimation results for a first-order moving average model, MA(1), applied to the level series LQ. Conceptually, an MA(1) model explains current observations primarily through the current shock and a one-period lag of the shock. In contrast to an AR model-which emphasizes persistence through lagged dependent variables-the MA structure captures short-run dynamics through the "memory" of innovations. This perspective is particularly relevant when the series reacts strongly to unexpected events and when the adjustment pattern is governed by how shocks are transmitted rather than by lagged values alone.

The estimated MA coefficient is extremely large in magnitude, MA(1) ≈ 0.9998, and is statistically significant. At face value, this suggests that innovations in LQ are highly persistent in the sense that the effect of shocks is carried forward almost one-for-one to the next period. Interpreted economically, such a result would imply that short-run movements in LQ are dominated by strong innovation dynamics: a shock today is echoed very strongly in the following period, producing pronounced short-run inertia in the series' fluctuations.

However, this is precisely the point where a strict econometric interpretation is required. The reported inverted MA root equals -1.00, which indicates that the MA(1) process is near non-invertible (i.e., very close to the boundary of invertibility). In practical modeling terms, near non-invertibility is a warning sign: although the coefficient may appear statistically significant, parameter estimates can become numerically unstable, highly sensitive to small sample changes, and may not yield reliable out-of-sample performance. This concern is reinforced by the optimization warning reported by EViews-"Failure to improve SSR after 13 iterations"-which signals difficulties in the estimation procedure converging to a stable optimum. In short, the MA(1) result points to a strong innovation component, but the estimation diagnostics suggest that the specification is operating at the edge of what the data can reliably support.

The fit statistics (e.g., relatively high R-squared) should also be treated cautiously in this setting. When MA parameters approach the boundary, goodness-of-fit measures can be artificially inflated, and the model may effectively mimic other dynamic structures in small samples. Given that the sample size is limited (15 observations), the risk of overfitting is non-trivial. A strict reviewer would therefore not accept the MA(1) specification as a final forecasting model solely on the basis of statistical significance and in-sample fit, without additional diagnostic evidence and robustness checks.

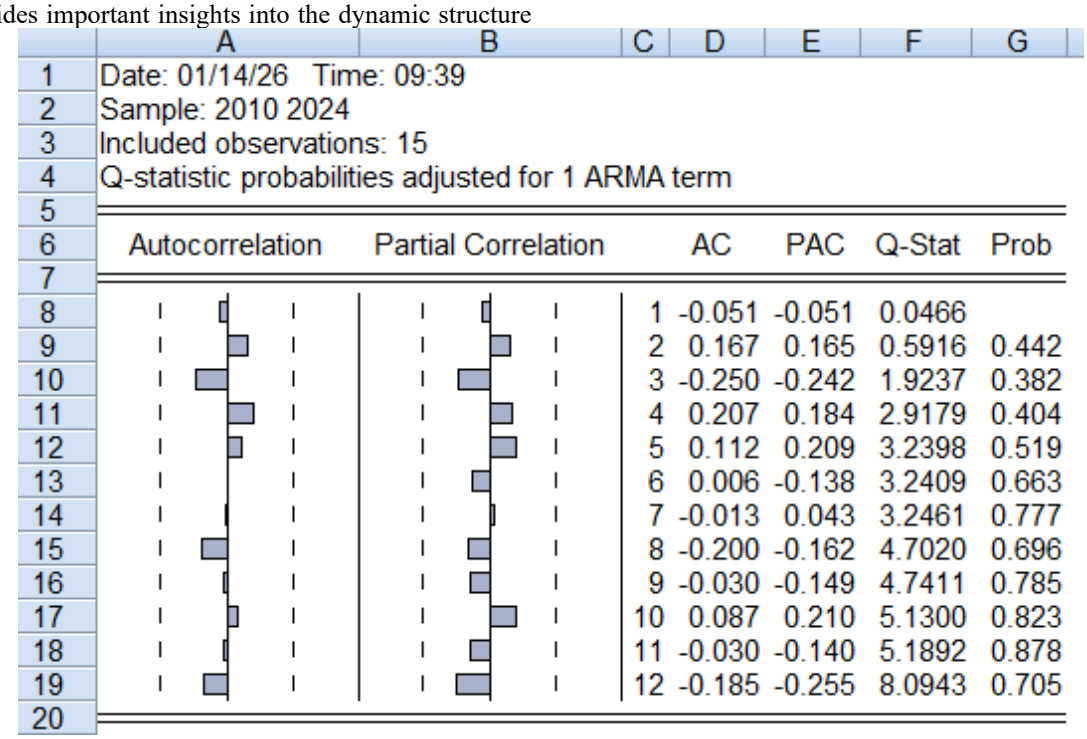
Accordingly, the appropriate role of Figure 4 in the empirical narrative is twofold. First, it demonstrates that innovation dynamics likely play a substantial role in shaping short-run movements in LQ, complementing the persistence captured by the AR(1) benchmark. Second-and more importantly-it highlights that a pure MA(1) representation in levels may be econometrically fragile due to near non-invertibility and convergence issues. This motivates the need to rely on a properly stationary representation (e.g., DLQ) and to validate candidate specifications through residual diagnostics (such as Ljung-Box Q-statistics/correlogram evidence) and out-of-sample forecast evaluation.

In summary, the MA(1) estimation provides informative evidence that shocks are transmitted strongly from one period to the next in the LQ series, yet the boundary behavior of the MA parameter and the reported estimation warning imply that this specification should be treated as a diagnostic benchmark rather than a definitive forecasting model. The next step is therefore to examine whether the residuals from the preferred specification behave as white noise and to select

the most statistically credible model for forecasting on the basis of diagnostic adequacy and predictive stability.

However, the estimated MA coefficient is extremely close to unity, indicating near non-invertibility. Such boundary behavior raises concerns regarding parameter stability and forecast reliability, particularly in a small sample setting. Consequently, the MA(1) specification is not retained as a final forecasting model and is interpreted solely as indicative evidence of strong innovation-driven dynamics.

While the estimation of AR and MA specifications provides important insights into the dynamic structure of the LQ series, coefficient significance and in-sample fit alone are not sufficient to establish model adequacy. A well-specified time series model must also satisfy key diagnostic conditions, most notably that its residuals behave as white noise. If residuals exhibit serial correlation, this indicates that relevant dynamics remain unmodeled, rendering parameter estimates and forecasts unreliable. Therefore, after evaluating alternative short-run specifications, the analysis proceeds with a formal diagnostic assessment based on residual autocorrelation tests.



	AC	PAC	Q-Stat	Prob
1	-0.051	-0.051	0.0466	
2	0.167	0.165	0.5916	0.442
3	-0.250	-0.242	1.9237	0.382
4	0.207	0.184	2.9179	0.404
5	0.112	0.209	3.2398	0.519
6	0.006	-0.138	3.2409	0.663
7	-0.013	0.043	3.2461	0.777
8	-0.200	-0.162	4.7020	0.696
9	-0.030	-0.149	4.7411	0.785
10	0.087	0.210	5.1300	0.823
11	-0.030	-0.140	5.1892	0.878
12	-0.185	-0.255	8.0943	0.705

Figure 5. Residual autocorrelation diagnostics for the the selected ARIMA(p,1,q) model: Correlogram and Ljung-Box Q-statistics

Source: *The model is compiled by the author based on data from the SSCRA*

Figure 5 presents the correlogram of residuals along with the Ljung-Box Q-statistics, adjusted for one ARMA term, to evaluate whether the remaining disturbances from the estimated dynamic model exhibit serial dependence. The correlogram reports both the autocorrelation (AC) and partial autocorrelation (PAC) coefficients across multiple lags, while the Q-statistic formally tests the joint null hypothesis that all autocorrelations up to a given lag are simultaneously equal to zero. Together, these diagnostics constitute a central criterion for assessing whether the model has successfully captured the systematic time dependence present in the data.

An inspection of the autocorrelation and partial autocorrelation functions reveals that the residual correlations at all reported lags remain relatively small in magnitude and fluctuate around zero without displaying any systematic pattern or slow decay. Importantly, none of the spikes in the correlogram exceed conventional significance bounds, which suggests the absence of persistent serial correlation in the residuals. From an econometric perspective, this visual evidence already indicates that the dominant dynamic structure of the LQ series has been adequately modeled and that no obvious lag dependence remains unaccounted for.

The formal Ljung-Box Q-statistics reinforce this conclusion. Across all lags considered, the associated probability values are comfortably above standard significance thresholds (5% and even 10%). This implies that the null hypothesis of no residual autocorrelation cannot be rejected at any lag length. In practical terms, the joint behavior of the residuals is statistically indistinguishable from that of a white-noise process. This outcome is particularly important in light of the earlier MA(1) estimation, which exhibited near-boundary behavior and convergence warnings. The absence of residual autocorrelation demonstrates that, despite these issues, the selected dynamic specification is sufficient to absorb the systematic temporal dependence in the series.

From a modeling standpoint, the Q-statistic results play a decisive role in validating the empirical strategy. Time series models that fail residual diagnostic tests often produce misleading inference and unstable forecasts, even when individual coefficients appear statisti-

cally significant. In contrast, the results reported in Figure 5 indicate that the remaining disturbances are purely random innovations, meaning that past information contained in the series has been effectively utilized by the model. This finding significantly strengthens the credibility of the subsequent forecasting exercise, as forecast errors derived from white-noise residuals are, by construction, unpredictable and unbiased.

Moreover, the diagnostic adequacy confirmed by the correlogram supports the methodological choice to rely on a parsimonious specification rather than introducing additional AR or MA terms. In small samples, overparameterization can easily lead to artificial improvements in fit at the cost of poor out-of-sample performance. The absence of residual autocorrelation suggests that expanding the model further would be unnecessary and potentially harmful, reinforcing the preference for a simpler, well-behaved structure.

In summary, the correlogram and Ljung-Box Q-statistics provide strong evidence that the estimated dynamic model satisfies the key diagnostic requirement of residual whiteness. This result confirms that the short-run dynamics of LQ have been adequately captured and that no systematic information remains in the residuals. Consequently, the model can be regarded as statistically well specified and suitable for forecasting purposes. Having established diagnostic validity, the analysis can now proceed with confidence to the final stage, namely the generation and interpretation of out-of-sample forecasts.

6. Policy Implications and Development Recommendations

The policy implications derived from this study are directly grounded in the empirical evidence obtained from the univariate ARIMA-based time series analysis. The estimated dynamics reveal two key characteristics of gross fixed capital investment in Azerbaijan: a high degree of persistence and a strong sensitivity to short-run shocks. The presence of persistence, as captured by the autoregressive component of the stationary ARIMA representation, indicates that investment decisions and policy interventions exert effects that extend beyond a single period. At the same time, the pronounced role of innovation-driven disturbances highlights that unexpected economic, financial, or institutional shocks can rapidly transmit into investment flows and generate short-term volatility.

These findings imply that investment policy outcomes cannot be adequately evaluated through static indicators or one-off policy measures alone. Instead, policy effectiveness depends critically on how interventions interact with the dynamic adjustment mechanisms identified in the model. In an environment characterized by persistent investment behavior and strong shock transmission, abrupt policy shifts, discontinuous project implementation, or unstable financing frameworks may amplify volatility rather than stabilize capital formation. Consequently, the following policy recommendations are formulated in direct alignment with the estimated persistence and shock propagation mechanisms, with the objective of reducing excessive short-run volatility while strengthening the long-term stability and effectiveness of gross fixed capital investment.

Given the univariate nature of the model, the following policy implications should be interpreted as indicative rather than causal.

1. The empirical findings indicate that gross fixed capital investment flows in Azerbaijan are characterized by pronounced short-term fluctuations and strong shock effects. This pattern can largely be attributed to the concentration of investments in large-scale and high-risk projects. Under such conditions, investment dynamics become more volatile and vulnerable to external economic, financial, and institutional disturbances. Therefore, ensuring the sustainable development of gross fixed capital investment requires not only an expansion in investment volume, but also a structural transformation based on quality improvement and sectoral balance. In this context, the following measures are recommended:

- Redirecting investments toward sectors with high value-added potential, particularly:
- manufacturing and processing industries,
- technology- and innovation-oriented production activities,
- logistics and transport infrastructure,
- service sectors that are closely integrated with productive activities.

Reducing the share of projects that require high capital intensity but generate limited economic efficiency, through:

- reassessment of economic payback periods,
- more rigorous analysis of financial and implementation risks,
- consideration of alternative and more flexible investment instruments.

Stimulating small- and medium-scale investment projects, especially those that:

- enter economic circulation within a shorter time horizon,
- contribute to employment generation at the regional level,
- strengthen linkages between production and service sectors.

Maintaining a balanced composition of the investment portfolio across projects and sectors, by:

- distributing investment risks across different economic activities,
- limiting the spillover effects of sector-specific shocks on aggregate investment flows,
- supporting a more stable trajectory of capital formation.

The implementation of these measures can mitigate excessive volatility in investment flows and contribute to a more stable, predictable, and development-oriented process of gross fixed capital formation.

2. The time series analysis reveals that the level of gross fixed capital investment exhibits a strong dependence on past realizations, and that this effect does not dissipate fully in the short run. This indicates the presence of investment persistence, whereby the impact of investment decisions extends over multiple periods. In such an environment, the absence of policy consistency may weaken the effectiveness of capital formation and amplify fluctuations in investment dynamics. Consequently, enhancing long-term and stable planning in the

management of public investment is of critical importance. To this end, the following measures are proposed:

Aligning public investment programs more closely with medium- and long-term strategic documents, particularly:

- national development strategies,
- sector-specific roadmaps,
- regional socio-economic development programs.

Ensuring the phased implementation of investment projects over time, thereby:

- balancing the financial burden across fiscal years,
- preventing sharp spikes in investment flows caused by large-scale projects,
- reducing project execution and financing risks.

Minimizing frequent revisions of investment priorities, through:

- more comprehensive feasibility and cost-benefit assessments prior to project approval,
- limiting strategic changes during the implementation phase to exceptional circumstances,
- protecting investment decisions through institutional and procedural safeguards.

Strengthening the role of the Medium-Term Expenditure Framework (MTEF) in investment policy, by:

- planning investment expenditures within a multi-year horizon,
- ensuring the sustainability of financing sources,
- reinforcing fiscal discipline and budgetary predictability.

Enhancing predictability in public investment decisions, which, in turn:

- creates a more stable investment environment for the private sector,
- encourages private investment to play a complementary role alongside public projects,
- facilitates long-term business planning and decision-making.

Overall, the adoption of a consistent and long-term planning approach in public investment management can significantly improve the stability of gross fixed capital investment flows and positively shape economic expectations. Such an environment fosters greater predictability for both public and private investors and strengthens the long-term sustainability of capital formation.

3. In Azerbaijan, a substantial share of gross fixed capital investment is concentrated in specific regions and around large-scale projects. Such spatial concentration may intensify volatility in aggregate investment dynamics and contribute to widening regional disparities in socio-economic development. When investment flows are unevenly distributed across regions, local economic resilience weakens and the overall stability of capital formation becomes more vulnerable to project-specific or regional shocks.

To address this challenge, investment policy should place greater emphasis on a balanced regional approach. This requires a differentiated assessment of regional investment potential, taking into account economic capacity, infrastructure readiness, labor availability, and long-term development prospects. In economically lagging regions and areas at an early stage of development-particularly in the liberated territories-the implementation of phased and well-coordinated investment strategies is especially important. Gradual investment allocation allows resources to be absorbed more efficiently and reduces the risk of sharp fluctuations in aggregate investment statistics.

Moreover, the potential macroeconomic impact of large regional projects should be evaluated ex ante, ensuring that their timing and scale do not generate excessive volatility at the national level. By promoting a more even geographical distribution of investment activity, policymakers can support a smoother trajectory of gross fixed capital formation and foster more inclusive and stable economic development across regions.

4. Both the empirical findings and the broader literature suggest that the effectiveness of gross fixed capital investment is determined not only by its volume but also by its efficiency and institutional quality. Strong shock transmission in investment dynamics is often associated with implementation delays, weak coordination mechanisms, and deficiencies in project governance. Without adequate institutional frameworks, even large investment inflows may fail to generate the intended economic outcomes.

In this context, strengthening governance and management practices in investment processes is essential. Greater emphasis should be placed on improving project oversight mechanisms, ensuring transparency and accountability throughout the investment lifecycle. The adoption of modern project management and monitoring systems can help reduce implementation risks, prevent cost overruns, and enhance coordination among involved institutions.

In addition, the systematic use of performance indicators to evaluate investment outcomes would contribute to better decision-making and resource allocation. By linking investment expenditures to measurable economic and social results, policymakers can improve the predictability and effectiveness of investment flows. Such improvements in institutional governance can significantly enhance the stability and credibility of capital formation and reduce the likelihood of disruptive investment shocks.

5. The long-term development of gross fixed capital investment should not be limited to traditional infrastructure projects alone. Contemporary economic challenges increasingly require investment strategies to be aligned with innovation, digital transformation, and environmental sustainability. A shift toward a more forward-looking investment model is therefore necessary to ensure that capital formation contributes to structural transformation rather than short-term expansion only.

In this regard, increasing investment in digital infrastructure and technology-based projects can enhance productivity and support the modernization of economic activities. At the same time, expanding the share

of green energy and environmentally sustainable projects within gross fixed capital formation can strengthen resilience to external shocks and align investment policy with global sustainability objectives. Encouraging capital accumulation in innovative production sectors further supports diversification and long-term competitiveness.

Adopting a sustainable and innovation-driven investment model enables gross fixed capital investment to generate enduring economic value. Such an approach ensures that investment dynamics contribute not merely to short-term growth, but to long-term structural change, economic resilience, and inclusive development.

7. Conclusion

The empirical analysis presented in this paper provides new insights into the short-run dynamics and stochastic structure of gross fixed capital investment in Azerbaijan. The evidence indicates that investment behavior is shaped by a combination of persistence and sensitivity to shocks, reflecting the cumulative nature of capital formation processes in an economy where large-scale projects and public investment play a central role. The identification of an integration order of one implies that disturbances to investment levels may have lasting effects, reinforcing the importance of appropriate data transformation and careful model specification in empirical investment analysis.

The estimated autoregressive dynamics reveal that investment adjustments occur gradually rather than instantaneously, suggesting that policy decisions and economic shocks influence capital accumulation over multiple periods. This persistence highlights the relevance of stable and predictable investment planning, as abrupt policy shifts or project interruptions may amplify volatility instead of mitigating it. At the same time, the presence of strong innovation-driven dynamics indicates that unexpected shocks-whether economic, financial, or institutional-can significantly shape short-term investment outcomes, particularly in environments characterized by concentrated and large-scale investment activity.

The diagnostic validation of the selected time series specification strengthens the credibility of these findings. The absence of residual autocorrelation confirms that the systematic temporal dependence in the investment series has been adequately captured, ensuring that the estimated dynamics reflect genuine economic behavior rather than statistical artifacts. As a result, the model provides a sound foundation for short-term forecasting and for interpreting investment fluctuations within a coherent econometric framework.

From a broader perspective, the results underscore that investment dynamics in Azerbaijan cannot be fully understood through static or purely long-run approaches. Instead, short-run adjustment mechanisms, persistence, and shock transmission play a decisive role in shaping capital accumulation paths. While the univariate framework adopted in this study offers a clear and statistically robust characterization of these dynamics, future research could extend the analysis by incorporating macroeconomic drivers, accounting for structural breaks, and exploring higher-frequency data. Such extensions would further enhance understanding of investment behavior and support the design of more resilient and forward-looking investment policies.

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MEDICAL SCIENCES

ROLE OF PCR METHOD IN DIAGNOSTICS OF UROGENETAL INFECTIONS THAT SPREAD RAPIDLY IN MODERN TIMES: EFFECTIVENESS OF STI-8 PANEL

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Abstract
Sexually transmitted infections (STIs) remain a serious challenge for global health systems and have a significant impact on reproductive health, pregnancy outcomes, neonatal outcomes, and public health. Traditional microbiological diagnostic methods often have limited sensitivity and long turnaround times. For this reason, molecular diagnostic methods, especially polymerase chain reaction (PCR)-based multiple test panels, are widely used in modern clinical practice. The presented article analyzes the role of the PCR method in the diagnosis of urogenital infections during studies conducted at the TCK of ATU, the clinical significance of the main pathogens included in the STI-8 panel, and the diagnostic effectiveness of this panel with a scientific approach.

Keywords: sexually transmitted infections, Real-Time PCR, multiplex PCR, STI-8 panel

Introduction: Sexually transmitted diseases (STDs) are characterized by hundreds of millions of new infections worldwide each year and pose a serious health risk to women, men, and young people of reproductive age. According to the World Health Organization, *Chlamydia trachomatis, Neisseria gonorrhoeae, Trichomonas vaginalis, and Mycoplasma genitalium* are the most common bacterial and protozoan STI pathogens. [1]. These infections are often asymptomatic and are therefore diagnosed late, resulting in chronic inflammatory processes, infertility, ectopic pregnancy and neonatal complications[2]. Infections of the urogenital tract are transmitted through unprotected vaginal, anal and oral sex, vertical transmission (during pregnancy and childbirth), and rarely through contaminated medical instruments. The clinical symptoms of STDs vary over a wide spectrum: clinical forms such as urethritis, cervicitis, vaginitis, pelvic inflammatory disease, prostatitis, and epididymitis can be observed. However, in a significant proportion of cases, the infection is latent, which is detected only through laboratory tests[3].

The introduction of molecular diagnostics, especially the PCR method, has enabled early and accurate detection of STDs and significantly improved the clinical decision-making process[4].

One of the most important tasks facing modern medicine, especially urology, gynecology and venereology, is the timely detection of infectious and inflammatory diseases of the urogenital tract. Sexually transmitted infections (STIs) are not only an individual health problem, but also a socio-economic burden affecting reproductive health at the global level. According to the latest statistical reports of the World Health Organization (WHO), more than 370 million new cases of treatable STIs (chlamydia, gonorrhea, trichomoniasis, etc.) are registered in the world every year[5].

The clinical picture of urogenital infections has changed significantly in recent decades. If previously these infections manifested themselves with acute symptoms (profuse discharge, severe pain), currently there is an increase in asymptomatic or mildly symptomatic (subclinical) forms. This "hidden" course leads to late referral of patients to medical care. As a result, infections that are not treated in a timely manner lead to chronic prostatitis, epididymitis and impaired spermatogenesis in men, and pelvic inflammatory disease, ectopic pregnancy and secondary infertility in women [6].

One of the main difficulties in modern diagnostics is "mixed infections" or polymicrobial associations. Often, not just one type of pathogen, but several pathogenic and conditionally pathogenic microorganisms are simultaneously involved in the inflammatory process in a patient. Although traditional microscopic examination and bacteriological culture methods have high specificity, their sensitivity is insufficient for the detection of many microorganisms (for example, *Mycoplasma genitalium or Chlamydia trachomatis).* Also, the bacteriological cultivation method requires a long time (3-7 days), which leads to a delay in treatment[7].

In solving these problems, Real-Time PCR (Polymerase Chain Reaction) technology has emerged as the "gold standard" in diagnostics. The main advantage of the PCR method is its high analytical sensitivity and specificity; This method can identify the pathogen even when there are only a few copies of its DNA in the biological material[8]. The STI-8 panel (simultaneous determination of 8 pathogens) applied in the laboratory department of the Teaching Surgery Clinic of the Azerbaijan Medical University is one of the most effective forms of this technology. This panel simultaneously screens for both obligate pathogens and opportunistic pathogens (e.g., Ureaplasma species) that cause inflammation when present above a certain concentration in a urethral smear. The STI-8 panel detects multiple agents simultaneously, allowing for the detection of co-infections in patients. This allows for a more accurate assessment of the patient's clinical

status and selection of an appropriate treatment strategy[9].

Table 1.

Clinical efficacy of the STI-8 Panel

Pathogen	Main clinical form	Possible complications
Chlamydia trachomatis	Urethritis, cervicitis	Infertility, ectopic pregnancy
Neisseria gonorrhoeae	Gonorrhea, pelvic inflammation	PID, neonatal ophthalmia
Mycoplasma genitalium	Nongonococcal urethritis	Chronic urethritis, infertility
Mycoplasma hominis	Vaginitis, PID	Pregnancy complications
Ureaplasma urealyticum	Urethritis	Premature birth
Ureaplasma parvum	Asymptomatic carriage	Neonatal infections
Trichomonas vaginalis	Vaginitis, urethritis	Increased risk of HIV transmission
Gardnerella vaginalis	Bacterial vaginosis	Pregnancy complications

Table 2.

Comparison of PCR and traditional diagnostic methods

Indicator	PCR (multiplex)	Cultivation / Microscopy
Sensitivity	High (90–100%)	Medium–Low
Result time	24–48 hours	3–7 days
Detection of co-infection	Possible	Limited
Asymptomatic cases	Effective	Difficult
Indicator	PCR (multiplex)	Cultivation / Microscopy

Scientific studies have shown that multiplex PCR-based STI panels demonstrate 90–100% sensitivity and high specificity. The use of the STI-8 panel: ensures early diagnosis, detection of asymptomatic carriers, selection of targeted antibiotic therapy, and reduction of the risk of relapse and re-infection. The STI-8 panel is of particular clinical importance in pregnant women, patients with infertility problems, and high-risk groups[10].

The aim of the study: To determine the diagnostic efficacy of the STI-8 multiplex PCR panel and the frequency of pathogens in patients with suspected urogenital pathology.

Materials and methods: The research work was carried out in the central laboratory of the Educational Surgical Clinic of the Azerbaijan Medical University (AMU ESC) equipped with modern technological equipment from 10.09.2025 to 25.12.2025. Urethral swab samples taken in accordance with aseptic rules from patients receiving treatment in hospital conditions, as well as from patients who referred to the laboratory with urogenital complaints by a doctor, were used as biological material for the examination. In the presented research study, the results of the application of the STI-8 multiplex PCR test were analyzed, and the diagnostic speed of this method and its role in determining complex treatment tactics were scientifically and practically substantiated.

During the study, samples from 177 patients were processed. The patients who presented were mostly between 25 and 40 years of age, with more infections recorded in men over the age of 30. Samples were collected in sterile transport media, standard aseptic procedures were followed to prevent contamination, and delivered to the laboratory according to the manufacturer's instructions.

Methodological and technical support: The Real-Time PCR (Polymerase Chain Reaction) method, the latest achievement in molecular genetic diagnostics, was used in the course of the study. This method is based on the isolation, amplification and real-time detection of specific DNA fragments of pathogenic microorganisms in the biological material under study. The laboratory stage was carried out using fully automated systems, which minimized errors caused by the human factor and ensured a high degree of accuracy of the results. Simultaneous detection of pathogens was ensured using specific primers and fluorescent probes in accordance with the STI-8 panel (table 1).

The thermocycling program included an initial denaturation step followed by 40 amplification cycles. Fluorescence signals were recorded in real time. Positive, negative and internal control samples were used in each test series.

Scientific Basis of the STI-8 Panel: The STI-8 test system used is in a multiplex format and allows you to identify the 8 most dangerous pathogens of the urogenital tract in a single reaction. This includes obligate pathogens (*Chlamydia trachomatis, Neisseria gonorrhoeae, Trichomonas vaginalis, Mycoplasma genitalium*) and clinically significant opportunistic pathogens (*Mycoplasma hominis, Ureaplasma urealyticum, Ureaplasma parvum, Gardnerella vaginalis*). Quantitative analysis (titer indicators) is the basis for the assessment of opportunistic microorganisms, which allows for the differentiation of the carrier state from the active inflammatory process.

Statistical analysis: All obtained clinical and laboratory indicators were analyzed using modern statistical software packages, and the percentage of occurrence of each pathogen in the population and the structure of concomitant infections (coinfections) were calculated using mathematical methods. Statistical analysis of the obtained results was carried out using SPSS software. Quantitative indicators were expressed as mean ± standard deviation, and qualitative indicators were expressed as percentage. The prevalence of

pathogens was assessed using descriptive statistical methods.

Table 3.

Distribution structure of positive results on the TI-8 Panel by pathogens and gender

Pathogens	Males (n=83)	Females (n=94)	Total (n=177)	Type of Infection
C.trachomatis	5	1	6	Mono-infection
N.gonorrhoeae	5	0	5	Mono-infection
G.vaginalis	3	4	7	Mono-infection
U.parvum	0	1	1	Mono-infection
U.urealyticum	0	1	1	Mono-infection
G.vaginalis + U.urealyticum	0	1	1	Mixed (binary)
U.urealyticum + U.parvum	1	0	1	Mixed (binary)
U.urealyticum + N.gonerrhoeae	1	0	1	Mixed (binary)
U.parvum + G.vaginalis	1	0	1	Mixed (binary)
G.vaginalis + N.gonorrhoaea	1	0	1	Mixed (binary)
G.vaginalis + M.hominis + U.parvum	1	0	1	Mixed (Triplex)
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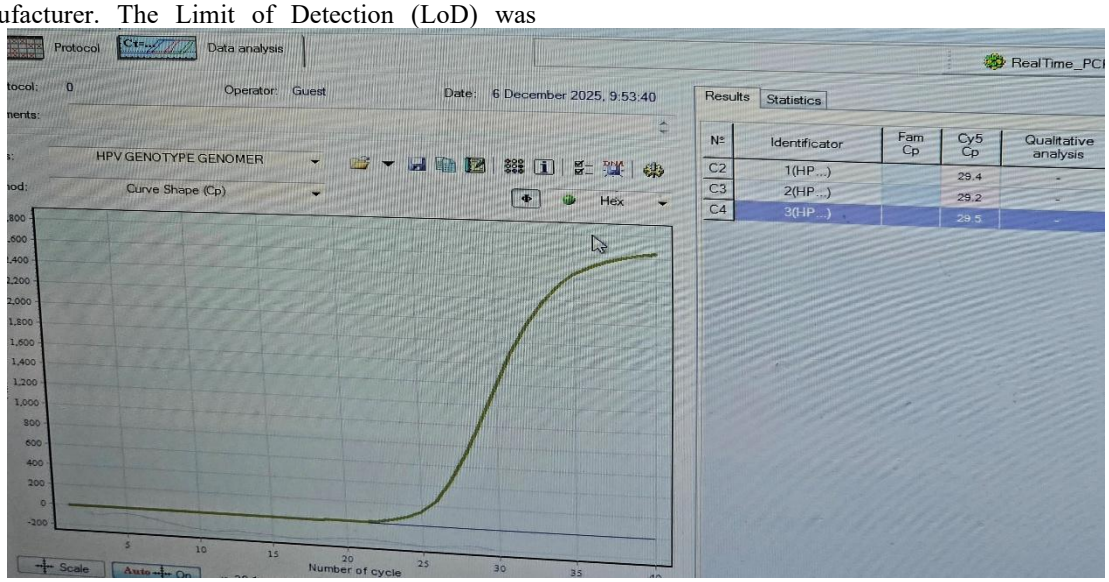
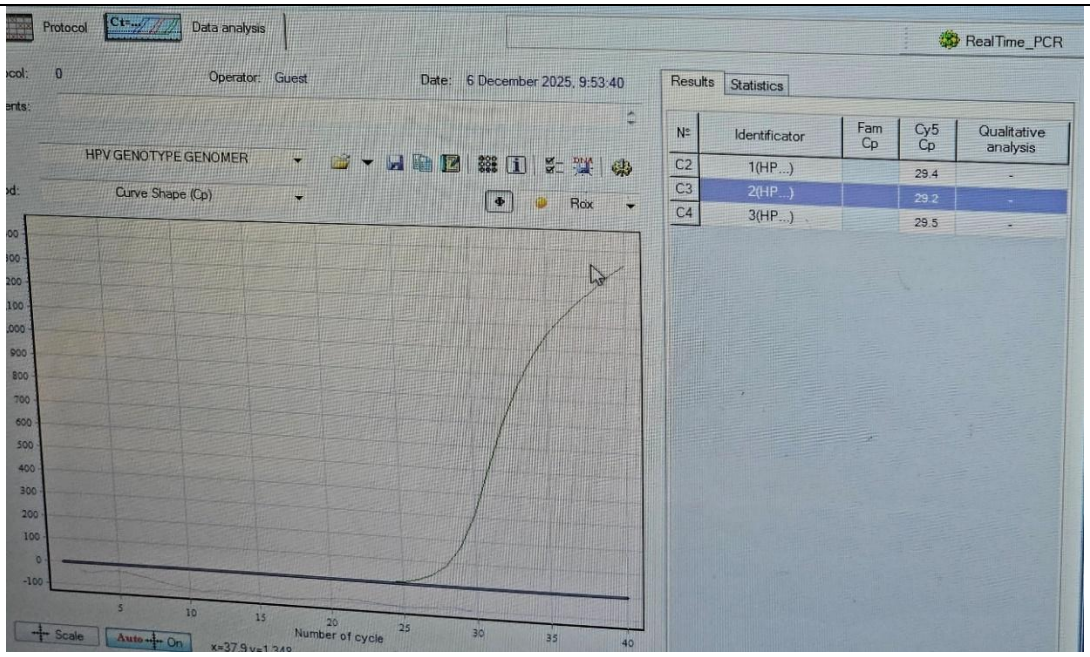
Total Positive Patient	18	8	26	(14.7%)

Analytical Sensitivity and Specificity. The analytical performance of the STI-8 panel was evaluated based on validation data provided by the manufacturer. The Limit of Detection (LoD) was determined separately for each pathogen and the results were interpreted based on the Ct (cycle threshold) values.





Conclusion: The results of the study allow us to draw the following conclusions:

High Diagnostic Accuracy: The STI-8 multiplex PCR panel, applied in the laboratory of the ATU Educational-Surgeric Clinic, allowed to identify latent or overt pathogens in 14.7% of patients with urogenital symptoms. The high sensitivity of this method ensures accurate diagnosis of Chlamydia trachomatis and Mycoplasma species, which are difficult to detect with classical methods.

Gender-Different Pathogen Profile: The study showed that while men have a higher incidence of obligate pathogens (*especially N. gonorrhoeae*), women are more likely to have dysbiotic conditions accompanied by an increase in the number of opportunistic pathogens (*Gardnerella, Ureaplasma*). This proves the importance of an individual diagnostic approach for both sexes.

Conclusion: The PCR method in the diagnosis of urogenital infections, especially the multiplex real-time PCR-based STI-8 panel, is a modern, reliable and highly informative method in the diagnosis of urogenital infections, one of the most important tools of the modern clinical laboratory. High sensitivity, early detection of STDs, detection of co-infections, rapid turnaround time, and broad pathogen coverage make these tests effective and reliable. This allows for the formulation of early detection and effective treatment strategies, ultimately improving the health outcomes of patients.

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MODELS OF THE PHYSICAL ACTIVITY ACCORDING SELF-EVALUATION OF MEDICAL STUDENTS

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Abstract

Background and Study Aim. The physical fitness is especially important component of medical students as well, as their skills to evaluate corresponding level. This research aims to develop models of the physical activity according self-evaluation of medical students.

Material and Methods. The International Physical Activity Questionnaires was applied to study self-evaluation of medical students of the first grade (55 males and 184 females). All the students gave their informed consent prior to their inclusion in the study. Details that might disclose the identity of the subjects under study were omitted. Factor analysis was used with a purpose to determined factors of variables for studied battery of tests. Factor Loadings (Unrotated) Extraction: Principal components (Marked loadings are $r>0.7$). Include condition: 5. calculations and graphical presentation of the studied materials was organized using computer packet Statistica and Excel DATA analysis.

Results. Models of the physical activity according self-evaluation of medical students have been developed using 5 factors for males and 4 factors for female students. Eigenvalues presented male results appear approximately two times greater than corresponding eigenvalues from the female group. All the values (4.555, 2.505, 2.484, 2.045) exceed two. Because results of one variable brought the same values (5 days a week) they were ignored, therefore female group as well as male group were tested with the questionnaire of 14 questions. All the fourteen studied variables showed a high level of variation ($V>22\%$).

Conclusions. Modeling of the physical activity according self-evaluation of medical students showed their professional preparation. Participation in this research should be considerate as an effective way of education.

Keywords: fitness, questionnaire, modeling, male, female

Introduction

Recently, evaluation of a body height and weight harmony among university students has been studied by S. Nowak and I. Zanevskyy [1]. They evaluated appearance by female medicine students, too [2]. This research aims to develop models of the physical activity according self-evaluation of the medical students. Garcia-Alvarez D. and Faubel R. developed a systematic review strategies and measurement tools in physical activity promotion interventions in the university setting [3]. Objective and subjective investigation of physical activity levels and its relation with socio-demographic characteristics among medical students have been published by Farshbaf-Khalili A. et al. [4]. Abdoli M. et al. determinants of physical activity among female students based on the trans-theoretical model [5].

Lucini et al. (2024) showed a significance of stress, exercise and nutrition assessing the lifestyle in a large cohort of undergraduate students [6]. Kukic et al. described physical activity as a means to improve subjective vitality of university students [7]. Moss S. et al. (2024) studied the associations of physical activity and health-risk behaviours toward depressive symptoms among college students regarding gender and obesity disparities [8]. Johannes C. et al. presented systematic review on the strategies and best practices that enhance the physical activity levels of undergraduate university students [9]. Donnelly S, et al. provided a systematic review on the effectiveness of physical activity interventions in improving higher education students' mental health [10]. Edelmann D. et al. studied physical activity and sedentary behaviour in university students-the role of gender, age, and field of study, targeted degree, and study semester [11]. Diehl K. et al. discussed comparative physical activity as a global question to assess physical activity among university students [12]. Dąbrowska-Galas M, et al. determined physical activity level, insomnia and related impact in medical students in Poland [13].

Coenen P.et al. determined associations of occupational and leisure-time physical activity with all-cause mortality regarding individual participant data meta-analysis [14]. Brown CEB et al. determined key influences on university students' physical activity as a systematic review using the Theoretical Domains Framework and the COM-B model of human behaviour [15]. Barbosa BCR, et al. studied sedentary behaviour associated with the mental health of university students during the Covid-19 pandemic, and not practicing physical activity accentuates its adverse effects: cross-sectional study [16]. Amornsriwatanakul A. et al. determined multilevel factors associated with physical activity participation among Thai university students [17]. Alahmadi MA et al. studied prevalence of sedentary behaviour among university students in Saudi Arabia [18].

Hypothesis. Males and Females medicine university students are able to use their professional skills in modeling of self-evaluation of the physical fitness.

The purpose of the research was to develop models of the physical activity according self-evaluation of

the medical students. This goal was achieved by solving the problems as follow: to provide a self-evaluation questionnaire of medical students (1); to study the results of physical activity questionnaire (2); to adopt a factor analysis in the study of the problem (3).

Materials and Methods

Participants

Two hundred thirty nine students (184 females 21,9 y.o., and 55 males 22,0 y.o.) of a first education year were interrogated about their physical activity during studying at the university as well, as out of studying. All the students gave their informed consent prior to their inclusion in the study. Details that might disclose the identity of the subjects under study were omitted.

Questionnaire

The International Physical Activity Questionnaires (IPAQ) Form in Polish / English

Var1. Intensywny wysiłek fizyczny (minut tygodniowo) / Intense physical effort (minutes per week)

Var2. Ile było takich dni w przeciętnym tygodniu? / How many such days were there in an average week?

Var3 Ile minut przeciętnie trwał taki wysiłek w ciągu jednego dnia? / How many minutes did such effort last on average in one day?

Var4. Umiarkowany wysiłek fizyczny (minut tygodniowo) / Moderate physical effort (minutes per week)

Var5. Iile było takich dni w przeciętnym tygodniu? / How many such days were there in an average week?

Var6. Iile minut przeciętnie trwał taki wysiłek w ciągu jednego dnia? / How many minutes did such effort last on average in one day?

Var7. Chodzenie lub spacerowanie (minut tygodniowo). / Walking (minutes per week).

Var8. Iile minut przeciętnie trwał taki wysiłek w ciągu jednego dnia? / How many minutes did such effort last on average in one day?

Var9. Iile minut przeciętnie trwał taki wysiłek w ciągu jednego dnia? / How many minutes did such effort last on average in one day?

Var10. AF tygodniowa ogółem (min). / Total weekly AP (min)*

Var11. AF ogółem (h) / Total AP (h)

Var12. Siedzenie i leżanie uwzględniając tylko dni powszednie (minut in 5 dni) / Sitting and lying down taking into account only weekdays (minutes in 5 days)

Var13. Ile takich dni było w przeciętnym tygodniu? / How many such days were there in an average week?

Var14. Iile minut dziennie przeciętnie spędzałeś siedząc lub leżąc? / How many minutes per day did you spend sitting or lying down on average?

Var15. Bezruch ogółem (h). / Total immobility (h)

*AF: Aktywność fizyczna / AP – Physical activity.

Statistical elaboration

Factor analysis was used with a purpose to determined factors of variables for studied battery of tests. Factor Loadings (Unrotated) (Spreadsheet1) Extraction: Principal components (Marked loadings are $r>0.7$, $p=0.05$). Include condition: 5. Calculations and graphical presentation of the studied materials was organized using computer packet Statistica and MS Excel DATA analysis.

Results

Statistical parameters of the female group have been presented in Table 1.

Table 1

Results of testing of the physical activity according the IPAQ questionnaire (Females, n_F=184)

Statistics	Var1	Var2	Var3	Var4	Var5	Var6	Var7	Var8	Var9	Var 10	Var 11	Var12	Var13	Var14
Max*	360	7	120	600	7	120	720	7	120	930	16	3750	5*	750
Me	30	1	20	80	2	30	210	6	40	390	7	2100	5	420
Min	0	0	0	0	0	0	0	0	0	30	1	600	5	120
M	55	2	24	106	2	38	237	5	45	398	7	2246	5	450
SD	67	1	25	106	2	30	135	2	24	195	3	511	0	102
V%	122	95	102	100	68	80	57	31	53	49	49	23	0	23

*Notes: n_F – number of female subjects, *Max* – maximal, *Min* – minimal, *Me* – median, *M* – Arithmetic mean, *SD* – standard deviation, V=100**SD/M* – coefficient of variation (%).

Because results of the test Var13 (see yellowed cells in the Table 1) brought the same values (5 days a week) they were ignored, therefore female group as well as male group were tested with the questionnaire of 14 questions. All the fourteen studied variables showed a high level of variation (V>22%).

Results of Factor Analysis are organized in Table 2.

Table 2.

Factor analysis results (Females, n_F=184)*

Variables	Factors				
	1	2	3	4	5
Var1	0.634	-0.169	0.403	0.581	-0.123
Var2	0.571	-0.193	0.447	0.395	-0.189
Var3	0.578	-0.029	0.244	0.643	0.105
Var4	0.661	0.180	0.377	-0.558	0.158
Var5	0.520	0.098	0.268	-0.522	-0.084
Var6	0.634	0.153	0.346	-0.336	0.376
Var7	0.542	-0.311	**-0.766**	0.011	-0.062
Var8	0.340	-0.220	-0.201	-0.261	**-0.791**
Var9	0.423	-0.217	**-0.709**	0.168	0.432
Var10	**0.955**	-0.177	-0.188	-0.095	0.000
Var11	**0.955**	-0.177	-0.188	-0.095	0.000
Var12	-0.221	**-0.948**	0.170	-0.121	0.079
Var13	-0.227	**-0.947**	0.173	-0.122	0.083
Var14	-0.227	**-0.947**	0.173	-0.122	0.083
Expl.Var	4.74	3.08	2.05	1.76	1.07
Prp.Totl%	33.8	22.0	14.6	12.6	7.7

*Note: n_M – females' number

Factor analysis has been provided when Eigenvalues were over one (Fig. 1).

According the 1st factor two tests (Var10 and Var11) showed strong correlation (r=0.955); according the second one - Var12 (r=-0.948), and the 3rd factor (Var7 and Var9). The 5th factor was presented by the test Var8 (r=-0.791). Factor Loadings (Unrotated) Extraction: Principal components. Marked loadings are r>0.700), i.e. strong correlation between variables and factors. Corresponding coefficients in the table are typed with bold numbers, for example **0.955** or **0.709**.

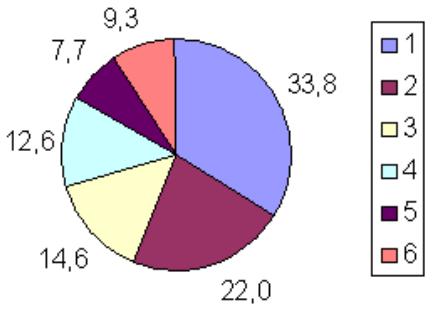

Fig. 1. Percentage income regarding studied factors 1 (33.8%), 2 (22.0%), 3 (14.6%), 4 (12.6%), 5 (7.7%), and the rest as factor 6 (9.3%).

Results of testing of the physical activity according the IPAQ questionnaire are collected in Table 3.

Table 3

Results of testing of the physical activity according the IPAQ questionnaire (Males, n_M=55*)

\Var Stat	1	2	3	4	5	6	7	8	9	10	11	12	13	14
*Max**	300	5	180	600	6	150	630	7	90	840	14	3600	720	12
Me	30	1	20	120	3	45	180	6	30	450	8	2100	420	7
Min	0	0	0	0	0	0	20	1	15	160	3	1200	180	3
M	71	2	33	156	3	57	227	6	41	454	8	2177	431	7
SD	79	1	36	127	1	40	136	1	22	169	3	593	124	2
V%	112	77	107	81	54	71	60	25	54	37	37	27	29	29

*Notes: n_M – number of male subjects, *Max* – maximal, *Min* – minimal, *Me* – median, *M* – Arithmetic mean, *SD* – standard deviation, *V*=100**SD/M* – coefficient of variation (%).

There were only 4 factors (one smaller than in the female study group factors) in the male study group as blue columns on the histogram (Fig. 2). Eigenvalues presented male results appear approximately two times greater than corresponding eigenvalues from the female group. All the values (4.555, 2.505, 2.484, 2.045) exceed two. Similar to the females results, all the 14 variables showed high level of variation (*V*>22%).

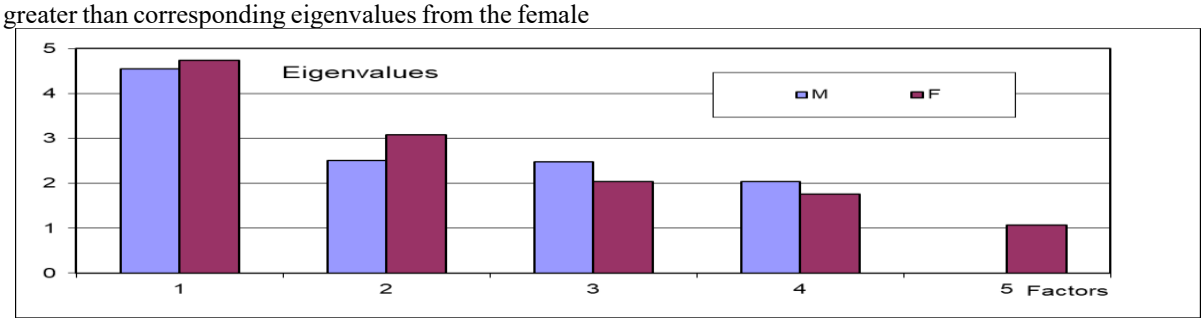

Fig. 2. Histogram of eigenvalues males (M) and females (F) in corresponding factors.

Because similar values of variables Var13 and Var14 (grey collar of sells), correlation between factors and variables appear the same too; (r=-0.855). Another pair of variables are Var10 and Var11 (r=-0.801). Var12 correlates with Factor 2, as well as Var1 correlates with Factor 3 (Table 4).

Table 4.

Factor analysis results (males, n_M=55)*

Variables	Factors			
	1	2	3	4
Var1	0.361	0.405	**0.798**	-0.018
Var2	0.443	0.430	0.496	0.192
Var3	0.206	0.335	0.712	-0.156
Var4	0.376	0.669	-0.613	-0.075
Var5	0.457	0.319	-0.322	-0.098
Var6	0.087	0.613	-0.646	-0.082
Var7	0.506	-0.679	0.007	-0.518
Var8	0.064	0.054	0.392	-0.514
Var9	0.453	**-0.714**	-0.183	-0.313
Var10	**0.855**	0.145	-0.076	-0.479
Var11	**0.855**	0.145	-0.076	-0.479
Var12	**-0.784**	0.208	0.024	-0.536
Var13	**-0.801**	0.173	0.011	-0.542
Var14	**-0.801**	0.173	0.011	-0.542
Expl.Var	4.56	2.51	2.48	2.05
Prp.Totl %	32.5	17.6	16.9	14.6

Note: n_M* – males' number

Discussion

Models of the physical activity according self-evaluation of medical students developed in this research have been completed resent studies regarding self-evaluations and appearance by female medicine, evaluation of a body height and weight harmony among university students [1,2]. Although, the research was dedicated to the physical activity of medical students, students of other specialties [19]. Correlations between physical activity and body dissatisfaction, lifestyle, and nutritional status among university students are studied too. [20].

The results of this study correlate with well-known scientific publications regarding the Relationship Between Sedentary Lifestyle, Physical Activity and Stress in University Students and Their Life Habits (A Scoping Review with PRISMA) [21]. Furthermore, physical fitness evaluation level correlate with enhancing mental health, well-being and active lifestyles of university students by means of physical activity and exercise research programs [22]. Physical activity levels and sedentary behaviour according to sex, age, BMI, academic year, and country among medical students were confirm during studies in different universities not only of medical profile, but many other too [23,24]. Leisure-time physical activity, occupational physical activity and the physical activity paradox in healthcare workers.

Conclusions

Modeling of the physical activity according self-evaluation of medical students showed their professional preparation. Participation in this research should be considerate as an effective way of education. All the fourteen studied variables showed a high level of variation (V>22%). The purpose of the research was reached using development of models of the physical activity according self-evaluation of the medical students. This goal was achieved by solving the problems of providing a self-evaluation questionnaire of medical students.

Highlights

Factor analysis has been adopted for study of the results of physical activity questionnaire. Four factors were extracted during evaluation of males' students (with eigenvalues 4.56, 2.51, 2.48, 2.05) and five factors – females' students (with eigenvalues 4.74, 3.08, 2.05, 1.76, 1.07) correlation between variances was determined as strong (r=0.7, p=0.05).

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IDIOPATHIC MULTICENTRIC CASTLEMAN DISEASE - CASE REPORT AND LITERATURE REVIEW

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Abstract

Castleman disease is a heterogeneous lymphoproliferative disorder that includes unicentric (UCD) and multicentric (MCD) forms; MCD can be driven by HHV-8 or be HHV-8-negative (idiopathic, iMCD). Diagnosis can be challenging and management differs by subtype.

Case presentation: We present a de-identified adult patient with progressive constitutional symptoms, anemia, polyclonal hypergammaglobulinemia, and generalized lymphadenopathy. Lymph node biopsy showed characteristic features consistent with plasma-cell-rich iMCD. Infectious, autoimmune, and malignant causes were excluded; HHV-8 testing was negative. The patient received corticosteroids and anti-IL-6 therapy (siltuximab) with clinical and laboratory improvement.

Conclusions: Early recognition and subtype classification of Castleman disease is essential because UCD is typically cured by surgical excision, while MCD often requires systemic therapy directed at IL-6 or B-cells depending on HHV-8 status. Recent consensus diagnostic criteria and treatment guidelines inform workup and management.

Keywords: Castleman disease, diagnosis, treatment

Introduction

Castleman disease (CD) describes a group of rare lymphoproliferative disorders historically classified by location (unicentric vs multicentric) and histopathology (hyaline vascular, plasma cell, mixed). MCD includes HHV-8-associated disease and HHV-8-negative idiopathic MCD (iMCD). iMCD is a systemic, cytokine-driven disorder frequently involving interleukin-6 (IL-6) pathways and can be life-threatening. International consensus diagnostic criteria for iMCD were published to standardize diagnosis and facilitate timely therapy.

Case report

A 72-year-old man, previously apparently healthy man, was presented with 8-10 weeks of progressive fatigue, unintentional weight loss (5-6 kg), night sweats, and intermittent low-grade fevers. He also reported diffuse arthralgias and recent onset of early satiety.

Clinical examination: T 37.5°C; HR 92/min. Generalized, non-tender cervical, axillary and inguinal lymphadenopathy (nodes 1–3 cm), mild hepatosplenomegaly.

Laboratory investigations upon admission:

Hemoglobin 9.6 g/dL (microcytic), WBC 7.2 ×10^9/L, platelets 110 ×10^9/L.

Elevated CRP 56 mg/L, ESR 78 mm/hr.

Total protein 9.0 g/dL with polyclonal hypergammaglobulinemia on serum protein electrophoresis.

Renal and liver function - mildly elevated alkaline phosphatase; otherwise unremarkable.

Microbiology and serology:

HIV serology - negative.

HHV-8 by immunohistochemistry/PCR - negative.

Blood cultures and broad infectious workup negative.

Autoimmune serologies (ANA, RF) - negative.

Imaging: contrast CT chest/abdomen/pelvis: multiple enlarged lymph nodes in cervical, mediastinal, axillary, abdominal, and pelvic stations; moderate splenomegaly.

Histopathology

Excisional lymph node biopsy (inguinal): effaced architecture with expanded interfollicular regions, sheets of polyclonal plasma cells, regressed germinal centers with prominent vascularity — consistent with plasma cell-type Castleman disease (fig.1). Flow cytometry and clonality studies showed polyclonal B-cell populations (no lymphoma).

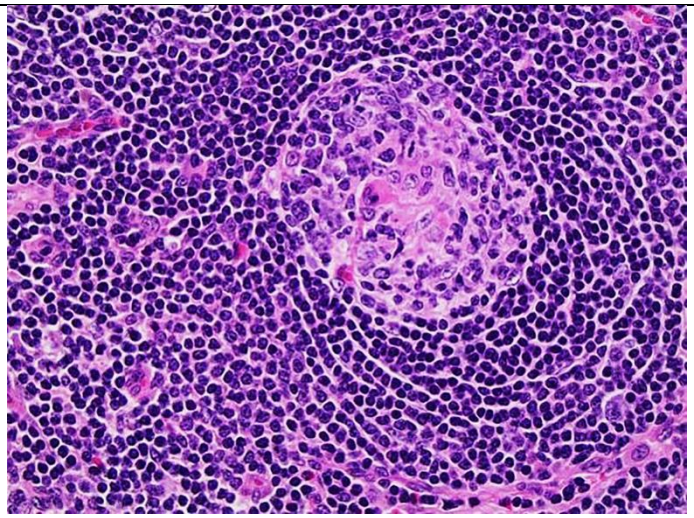

Fig.1

Diagnosis

The patient met the international criteria for iMCD after exclusion of HHV-8 and mimickers and with compatible histology and systemic features.

Treatment and Clinical Course

Initial management included short-course high-dose corticosteroids for symptom control. Given the diagnosis of HHV-8-negative iMCD with significant systemic inflammation and organ-threatening features, it was initiated anti-IL-6 therapy with siltuximab (11 mg/kg IV every 3 weeks), according to published guidance and evidence showing durable responses in many patients with iMCD. The patient demonstrated clinical improvement: resolution of fever, improved energy, rising hemoglobin, and reduction in CRP over 10–15 weeks. Corticosteroids were tapered. At 6 months the patient remained clinically stable on maintenance siltuximab, with normalized inflammatory markers.

Discussion

Castleman disease encompasses UCD and MCD. UCD typically presents as a single enlarged lymph node and is often hyaline-vascular histology; complete surgical excision is usually curative, with excellent long-term outcomes. MCD is systemic, involves multiple lymph node stations, and can be HHV-8-associated (often in immunocompromised hosts) or HHV-8-negative (iMCD). iMCD often involves cytokine dysregulation (IL-6) leading to systemic inflammation, cytopenias, and multiorgan dysfunction.

Because Castleman-like histology can be seen in other settings, international consensus diagnostic criteria for iMCD require characteristic histopathology, multicentric lymphadenopathy, specific clinical and laboratory features, and rigorous exclusion of mimics (infectious, neoplastic, autoimmune). Testing for HHV-8 and HIV is essential in MCD.

- UCD: Complete surgical excision is the treatment of choice and often curative; incomplete resection carries risk of recurrence. Preoperative planning should account for vascularity of nodes.

- HHV-8-associated MCD: Often responds to rituximab (anti-CD20) because HHV-8 infects B cells; antiviral therapy and antiretroviral therapy in HIV-positive patients are important adjuncts.

- iMCD (HHV-8 negative): Anti-IL-6 therapy (siltuximab is approved for iMCD) or IL-6 receptor blockade (tocilizumab) are recommended first-line systemic options; corticosteroids, immunomodulators, or cytotoxic regimens may be used for refractory disease. International treatment guidelines provide a stepwise algorithm, based on severity and response.

Prognosis depends on subtype and severity. UCD has excellent outcomes after complete resection. iMCD can be life-threatening if not recognized and treated; anti-IL-6 therapies have substantially improved outcomes but some patients remain refractory and may need alternative immunomodulation or chemotherapy.

Instead of conclusions

The diagnosis of Castleman disease in patients with unexplained generalized lymphadenopathy and systemic inflammation should always be suspected, and testing for HHV-8/HIV should be performed.

Histopathology is essential, but must be interpreted in the clinical context, as Castleman-like changes can also be seen in other diseases.

Treatment differs according to the clinical form: UCD → surgical excision; MCD → systemic therapy tailored to HHV-8 status and disease severity, with anti-IL-6 therapy being central to the care of iMCD.

Castleman disease is a heterogeneous entity that requires coordinated clinicopathological evaluation. The use of international diagnostic criteria and recent treatment guidelines helps to direct therapy - surgery for UCD and immunomodulatory therapy (especially anti-IL-6 agents) for iMCD - improving outcomes. Early recognition and rapid exclusion of alternative diagnoses are essential.

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HEALTHCARE-ASSOCIATED INFECTIONS IN GENERAL SURGERY – PREVENTION, CONTROL AND SHARED RESPONSIBILITY

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Abstract

Nosocomial infections (Healthcare-Associated Infections) represent one of the most important challenges of modern surgery, having a major impact on morbidity, mortality and hospital costs. In general surgery, the risk is amplified by the invasive nature of the interventions and the vulnerability of patients in the postoperative period. This article analyzes the main types of surgical-associated infections, specific risk factors, current prevention and control strategies, as well as the importance of the shared responsibility of the entire medical team in reducing these adverse events.

Keywords: nosocomial infections, general surgery, prevention, control, medical responsibility

Introduction

Healthcare-associated infections, traditionally called nosocomial infections, remain a major public health problem, affecting up to 5–10% of hospitalized patients, according to WHO data. In general surgery, these infections frequently manifest as wound infections, post-catheterization urinary tract infections, ventilator-associated pneumonia, and systemic infections (sepsis, bacteremia).

Reducing the incidence of these complications requires an integrated approach, based on standardized protocols, continuous vigilance, and interdisciplinary collaboration.

Etiopathogenesis

The most common infections encountered in surgical practice are:

• Surgical wound infections – represent 30–50% of nosocomial infections in surgery. They can be superficial (skin, subcutaneous tissue) or deep (fascia, peritoneal cavity). Predominant germs: Staphylococcus aureus (including MRSA), Enterococcus spp., Escherichia coli, Pseudomonas aeruginosa.

• Postoperative respiratory infections – often associated with intubation and mechanical ventilation, especially after major abdominal interventions.

• Urinary tract infections – frequently secondary to prolonged urinary catheterization, especially in elderly patients or with comorbidities.

• Systemic infections (sepsis) – may arise from postoperative bacterial dissemination, contaminated drainage or inadequately treated wound infections.

Predisposing factors can be grouped into three categories:

• Patient-related factors: advanced age, diabetes mellitus, obesity, malnutrition, immunosuppression, prolonged hospitalization;

• Intervention-related factors: long operative time (>2 hours), blood loss, use of implants or prostheses, intraoperative contamination;

• Environmental and personnel-related factors: failure to comply with asepsis rules, incorrect hand washing, incorrect use of antibiotics, overloading of wards.

Prevention and control

1. Preoperative measures

• Assessment and optimization of the patient's general condition (glycemic control, correction of anemia, preoperative hygiene);

• Appropriate antibiotic prophylaxis: administered 30–60 minutes before incision, according to current guidelines (e.g. cefazolin 1–2 g i.v.);

• Rigorous preparation of the surgical field (atraumatic hair removal, correct antisepsis).

2. Intraoperative measures

• Strict adherence to the rules of asepsis and antisepsis;

• Limiting the duration of the intervention and excessive tissue manipulation;

• Effective control of hemorrhage and use of sterile materials;

• Adequate ventilation in the operating room and periodic microbiological control of air and surfaces.

3. Postoperative measures

• Careful monitoring of wounds and drainages;

• Correct change of dressings;

• Limiting the duration of urinary catheterization and mechanical ventilation;

• Daily reassessment of the need for empirical antibiotic therapy;

• Patient education regarding personal hygiene and early signs of infection.

The role of the medical team and shared responsibility

Prevention of nosocomial infections does not depend only on the surgeon, but on the entire team involved in patient care: doctors, nurses, auxiliary staff, epidemiologists and microbiologists. Effective communication and compliance with institutional protocols are essential.

Shared responsibility includes:

• compliance with hand hygiene (the simplest and most effective measure);

• prompt reporting of any suspected infection;

• participation in periodic training on infection control;

• involvement of hospital management in logistical support (sterile materials, equipment, internal audit).

Overall, the rate of nosocomial infections in surgical wards is 8-20%, and in ICU wards, the maximum incidence reaches 28-30%.

In the Ist Clinical Surgery Unit of Brăila County Emergency Hospital, in the last 5 years, for an average of 1750 patients discharged annually, 14.6 infections associated with the medical act were found, according to the Single Register for the Declaration of HAIs (0.85%).

According to WHO and ECDC principles, the culture of patient safety must be integrated into the daily routine, not treated as an administrative obligation.

Conclusions

1. Nosocomial infections represent a major public health problem and an important cause of postoperative morbidity in general surgery.

2. Effective prevention requires rigorous application of standard aseptic measures, judicious antibiotic prophylaxis, and continuous epidemiological surveillance.

3. Control of these infections is a shared responsibility, involving the entire medical team, from the surgeon to the auxiliary staff.

4. Continuing education and periodic auditing are essential tools for maintaining quality and safety standards in surgical practice.

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PEDAGOGICAL SCIENCES

EMOTIONAL INTELLIGENCE AS AN IMPORTANT PEDAGOGICAL COMPETENCE IN THE SYSTEM OF PROFESSIONAL PEDAGOGICAL EDUCATION

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ЭМОЦИОНАЛЬНЫЙ ИНТЕЛЛЕКТ КАК ВАЖНАЯ ПЕДАГОГИЧЕСКАЯ КОМПЕТЕНЦИЯ В СИСТЕМЕ ПРОФЕССИОНАЛЬНОГО ПЕДАГОГИЧЕСКОГО ОБРАЗОВАНИЯ

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Abstract
The article examines the issue of developing emotional intelligence as an important pedagogical competence. Emotional intelligence is viewed as the ability to understand students' feelings and emotions, which makes it possible to influence their educational process, motivate them, and inspire them. It also has a positive impact on the teacher's emotional well-being and professional health.

Аннотация
В статье рассматривается проблема формирования эмоционального интеллекта как важная педагогическая компетенция. Эмоциональный интеллект рассматривается как умение понимать чувства и эмоции учащихся, позволяет влиять на их образовательный процесс, мотивировать и воодушевлять их. Он также благоприятно влияет на эмоциональное благополучие и профессиональное здоровье педагога.

Keywords: emotional intelligence, *pedagogical competence,* emotional stability
Ключевые слова: эмоциональный интеллект, педагогическая компетенция, эмоциональная стабильность, эмпирическое исследование.

Проблема готовности учителя к профессиональной педагогической деятельности и его педагогическая компетентность являются актуальной и часто исследуются в науке и практике. В современном компетентностном подходе все чаще на передний план выходят вопросы эмоциональной зрелости и эмоциональной подготовленности работников образования как важная компетенция, обеспечивающая качество образовательного процесса. Рассмотрим термин «эмоциональный интеллект» в контексте педагогических компетенций.

Термин «эмоциональный интеллект» впервые был использован в 1988 году израильским профессором психологии Рувеном Бар-Оном, однако, понятие «эмоциональный интеллект» было предложено позднее в 1990 году в работе «Emotional Intelligence» американских психологов Дж. Майера, Д. Карузо и П. Саловей.

Именно в «Emotional Intelligence» представлено официальное значение эмоционального интеллекта как набора навыков, имеющих отношение к точной оценке и эффективному регулированию своих и чужих эмоций, а также выражению своих чувств. Д. Карузо, Дж. Майер, П. Саловей и выдвинули положение о том, что эмоциональный интеллект включает в себя такие категории адаптивных способностей как проявление и оценивание эмоций, контроль чувств и переживаний, использование эмоций в процессе деятельности и мышления [4, 5].

Современный психолог И. Н. Андреева, определяет эмоциональный интеллект как природную возможность человека к самоанализу и анализу других индивидов, в сборе эмоциональной информации ее обработке и использованию, которая включает в себя значение отдельных эмоций, их сочетаний и последовательности, а также оценку отражаемых в них взаимосвязей. И. Н. Андреева [1], на основе собственных исследований, разработала свою модель эмоционального интеллекта.

Автор обращает внимание на единство интеллекта и личностных свойств, так как восприятие и переработка определенной информации зависит от индивидуальных особенностей личности. Так, одна и та же информация по-разному воспринимается двумя личностями с равными интеллектуальными способностями, в зависимости от их личностных свойств. В контексте педагогической деятельности это положение имеет особую значимость, так как

акцентирует внимание именно на личностные качества педагога, его индивидуальных особенностей.

Кроме этого, по мнению автора, эмоциональный интеллект и эмоциональная компетентность тесно взаимосвязаны. Так, высокий уровень эмоционального интеллекта формирует определенные компетенции, непосредственно связанные с эмоциональной сферой. Например, умение понимать чувства и эмоции учащихся позволяет влиять на их образовательный процесс, мотивировать и воодушевлять их. Или же, умение управлять собственными эмоциями позволяет избежать конфликтов в образовательном процессе, минимизировать риски межличностных напряженных взаимоотношений с родителями и в коллективе, формировать здоровое отношение к окружающим.

Д.В. Люсин предложил свою модель эмоционального интеллекта как способности к пониманию своих и чужих эмоций и управлению ими. Для обоснования этого определения автор раскрывает, что имеется в виду под способностью к пониманию и управлению эмоциями [2].

Способность к пониманию эмоций означает, что человек:

1. может распознать эмоцию, т.е. установить сам факт наличия эмоционального переживания у себя или у другого человека;
2. может идентифицировать эмоцию, т.е. установить, какую именно эмоцию испытывает он сам или другой человек, и найти для неё словесное выражение;
3. понимает причины, вызвавшие данную эмоцию, и следствия, к которым она приведёт.

Способность к управлению эмоциями означает:

1. контроль интенсивности эмоций, умение приглушать чрезмерно сильные эмоции;
2. контроль внешне выраженных эмоций;
3. при необходимости произвольный показ какой-либо эмоции.

Люсин Д.В. предложил принципиально новую модель эмоционального интеллекта. Эмоциональный интеллект автор определяет как способность к пониманию своих и чужих эмоций и управлению ими. Способностью к пониманию и управлению эмоциями Люсин Д.В. определяет следующим образом [3]:

1. Способность к пониманию эмоций определяется как умение распознать эмоцию, может идентифицировать, вербализировать, найти причины, вызвавшие данную эмоцию, и определить следствия, к которым она приведёт.
2. Способность к управлению эмоциями определяется как умение контролировать интенсивность эмоций. Данная способность выражается в двух формах: контроль внешне выраженных эмоций и произвольное отражение той или иной эмоции по необходимости в данной ситуации.

Как способность к пониманию, так и способность к управлению эмоциями может быть направлена не только на собственные эмоции, но и на эмоции других людей. Таким образом, можно выделить как внутриличностный, так и межличностный эмоциональный интеллект. Несмотря на то, что эти два вида предполагают выделение разных когнитивных процессов и навыков, однако они взаимосвязаны.

Люсин Д.В. считает, что эмоциональный интеллект не только когнитивная способность, так как способность к пониманию и управлению эмоциями непосредственно связан с общей направленностью личности на эмоциональную сферу. Поэтому, как отмечает автор, эмоциональный интеллект имеет двойственную природу, связана с когнитивными способностями и с личностными характеристиками [3].

В рамках нашего исследования способность к пониманию эмоций поможет распозновать эмоциональные переживания учащихся и преподавателей, отделить их от личности самого учащегося и преподавателя, не позволять эмоциям влиять на восприятие процесса, понимать причины, вызвавшие данную эмоцию и не поддаваться эмоциональному давлению.

Спосоюность к управлению эмоциями будет способствовать контролированию эмоциональных качелей, сохранять уравновешенность и контроль в эмоциональном плане, грамотно выражать свои эмоции во взаимодействии учитель-ученик, учитель-родитель, учитель-учитель, учитель-административный работник.

Таким образом, эмоциональный интеллект является наиболее важной педагогической компетенцией и рассматривается как умение идентифицировать, распознавать, понимать, а также управлять своими эмоциями и эмоциями других людей. Однако современное общество все более диктует рациональный образ мышления и жизни, таким образом вытесняя роль эмоционального фактора в жизни человека. И такое рациональное отношение к миру и к самому себе порождает неспособность перерабатывать и проживать эмоции, что в свою очередь приводит к ряду проблем: от психологических и психосоматических до социальных и коммуникативных.

Суммируя изученные исследования мы пришли к выводу, что для формирования эмоционального интеллекта имеют значение ряд составляющих: самосознание, самоконтроль, эмпатия, навыки управления отношениями, мотивация.

Эмоциональный интеллект благоприятно влияет также на эмоциональное благополучие и профессиональное здоровье педагога: способствует профилактике профессионального выгорания, дает ресурсы ддя сохранения и поддержания здорового психолого-педагогического и межличностного климата, обеспечивает мотивацию к профессиональной деятельности и удовлетворнности работой, помогает рационально подходить к сложные ситуации, переосмысливать и грамотно решать возникающие вложные ситуцации, тем самим способствуют формированию профессиональной стрессоустойчивости.

В рамках эмпирических исследолваний мы провели онлайн опрос среди педагогических работников Армении. В опросе участвовали 94 учителя из образовательных учреждений (школы, среднеспециальные и высшие учебные заведения).

Стаж работы опрошенных:

1. 0-3 года – 10,9 %
2. 4-7 лет – 23,9 %
3. 9-15 лет – 13 %
4. 16-30 лет – 26,1 %
5. Более 31 года – 26%.

Как показали результаты исследования, в сложных ситуациях, с вызывающим, неординарным поведением учеников большинство учителей (73,9%) пытаются понять мотивы поведения ученика и помогают его выйти из сложной ситуации проявляя эмпатию, 34,6 % могут себя контролировать и найти выход из ситуации, лишь 2,2 % используют свой авторитет и педагогическую позицию для решения проблемы.

На вопрос, что из себя представляет эмоциональный интеллект, половина респондентов (50%) не смогли дать ответа. Среди наиболее часто встречающихся ответов:

- Уровень развитости интеллекта.
- Взаимодействие идеи и эмоции.
- Осознание, понимание и управление эмоциями.
- Умение управлять своими и чужими эмоциями.

Учителя почти единогласно отметили, что эмоциональное состояние учителя влияет на профессиональную деятельность и развитие эмоционального интеллекта является важной педагогической компетентностью для современного педагога.

Более чем 80 % учителей отметили, что эмоциональной состояние ученика играет важную роль и обеспечивает результативность учебного процесса.

Большинство учитиелей также отметили, что если учитель сможет консролировать свои эмоции, не поддаваться эмоциональной провокации, он сможет формировать здоровое эмоциональное состояние у учеников, тем самым сможет контролировать эмоциональное состояние класса.

Таким образом, эмоциональный интеллект относится к числу гибких навыков, которые можно развивать. Ниже приведем несколько рекомендаций, которые помогут развивать эмоциональный интеллект.

- В течениие дня наблюдайте за своими эмоциями, постарайтесь концентрировать внимание на ваше эмоциональной состояние, понять причины возникновения той или иной эмоции.
- Заведите дневник эмоций. Запишите все эмоциональные состояния, которые у вас были в течении дня. По классификации отметьте, какие эмоции больше всего вы испытывали в течении дня (радость, грусть, раздражение, злость, страх, удовлетворение и т.д.).
- Отслеживайте свое эмоциональной состояние дома, в общении с другими людьми (друзья, случайные люди вокруг вас), на работе (ученики, коллеги, руководство, родители).
- Проследите, как вы реагируете на стрессовые ситуации. Какая ваша первая реакция. Научитесь считать до 60, прежде, чем вы среагируете на определенную ситуацию.
- Ведите привычку найти хотя бы 3 причины хвалить ваших учеников в классе.
- Помните: ваше эмоциональное здоровье и эмоциональная стабильность проявление не только вашей педагогической компетентности, но залог мотивации и результативности деятельности ваших учеников.

Таким образом, как показали результаты наших теоретических и эмпирических исследований, проблема эмоционального интеллекта является важной педагогической компетентностью современного педагога. Высокий уровень эмоционального интеллекта благоприятно влияет на психологический климат в коллективе, создает чувство удовлетворенности работой, помогает создавать здоровую эмоциональную атмосферу в классе.

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PHILOLOGICAL SCIENCES

ACTIVITIES FOR TEACHING LISTENING: TEACHING TO LISTEN AS A COMMUNICATIVE SKILL

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Abstract

We know that listening is more than just hearing words. So, listening as an active process whereby students receive, construct meaning from, and respond to spoken messages. Before we can develop appropriate assessment techniques for listening, we must first understand the nature of listening. Two models of listening have been identified in the literature: bottom-up and top-down approaches. The authors tried to explain how to approach to listening assessment and they shows activities for teaching listening. Here were given general versus of academic listening, considerations in designing listening tasks, background knowledge and test content.

Keywords: academic listening, knowledge, attitude, emphasis

The assessment of listening abilities is one of the least developed, yet one of the most important areas of language testing and assessment, In fact, Nunan calls listening comprehension "the poor cousin amongst the various language skills".[1,p.89]

As teachers we recognize the importance of teaching and then assessing the listening skills of our students, but-for a number of reasons- we are often unable to do this effectively. One reason for this is that the listening process is internal and not subject to direct study and observation. To learn to speak students first must learn to understand the spoken language they hear. In the past, educators hypothesized that listening was a passive skill because it could not be observed. In more recent theoretical models, listening is regarded as an active process. Another reason for the past neglect of the listening skill was that the productive skills of writing and speaking were emphasized. In recent years, however, the position on this has changed, and now a much greater emphasis is placed on listening.

Mr. Wright knows that listening is more than just hearing words. She views listening as an active process whereby students receive, construct meaning from, and respond to spoken messages. Because she sees listening as an integral part of the communication process, she is careful not to neglect this important skill. Some of the things she does in order to ensure valid and reliable listening assessment are:

*she consults her specifications before starting the listening test development process

*she uses a variety of assessment tasks with different listening purposes

*she collects authentic material to use for listening scripts, and so on. [2, p.90]

We have identified three major approaches to the assessment of listening abilities; discrete point, integrative and communicative approaches.

The discrete point approach became popular during the 1950s with the advent of audio-lingual method. This approach broke listening into component elements and assessed them separately. Some of the common question types in this approach included phonemic discrimination, paraphrase recognition, and response evaluation. The underlying rationale for the discrete-point approach stemmed from two beliefs; that it was important to be able to isolate one element of language from a continuous stream of speech and that spoken language was believed to be the same as written language, only presented orally.

The integrative approach started in the early 1970s. The underlying rationale for this approach is best explained by Oller. [3]:"Whereas discrete items attempt to test knowledge of language one bit at a time, integrative tests attempt to assess a learners capacity to use many bits at the same time. Proponents of the integrative approach to listening assessment believed that the whole of language is greater than the sum of its parts. Common question types in this approach were dictation and cloze.

The communicative approach arose at approximately the same time as the integrative approach as a result of the communication language teaching movement. In this approach, the listener must be able to comprehend the message and then use it in context. Communicative question formats should be authentic in nature.

General versus Academic Listening

Unlike foreign and second language listening in a conversational setting, a major part of listening in a university context involves lecture comprehension. Many observers have noted differences between general listening and academic listening. In some cases, these differences have important implications for testing.

Early work by Richards separated general and academic listening on a taxonomy of micro-skills.[4, p.92] Richards taxonomy identified 33 skills involved to general listening as well as 18 academic listening micro-skills.

Considerations in designing listening tasks

Before attempting to design a listening test, teachers should consult the course objectives and the listening test specifications that will provide information about objectives, formats and themes. The tasks should reflect those that occur in real-life situations, and the language used should be natural. As always the students should be able to use background knowledge to make sense of the test tasks and items. The primary focus of items should generally be on meaning rather than on form.

Background or prior knowledge needs to be taken into account because research suggests that background knowledge affects comprehension and test performance. However, take care to ensure that students are not able to answer test questions based on their background knowledge rather than on their comprehension.

Testers can control for background knowledge in one of three ways. First, test designers can ensure students have an equal amount of background knowledge by writing listening tests that exploit specific course materials. Second, they can provide students with the requisite background knowledge during testing via advanced organizers or practice prompts. Third, test writers can use topics that are unfamiliar to the entire student population. In any case, an attempt to standardize the presence or absence of background knowledge should be made in any listening text that purports to be a valid indicator of comprehension.

The test specification might provide you with information about the following:

*text types (narrative, descriptive, etc.)

*speech types to be used (phrases, single utterances, two person dialogues, multi-participant dialogue, monologues)

*mode of input (audio, video, live reader)

*varieties of English to be used

*scripted or unscripted input

*length of input (in time or number of exchanges for dialogues)

Some teachers feel that the unavailability of suitable texts is listening comprehensions most pressing issue because creating scripts that have the characteristics of oral language is not an easy task. In desperation, teachers take a reading text and transform it into a listening script, resulting in contrived and inauthentic listening tasks because written texts often lack the redundant features that are so important in helping us understand speech. A better strategy is to look for texts you like and then infuse oral characteristics into them.

Start by doing an inventory of the topics in a course and collect appropriate material well in advance of exam construction. Some strategies to help you infuse oral characteristics into reading texts are:

*Insert as oral marker at the beginning:" Today I am going to talk about…"

*Spoken language typically uses less complex structures than written text, so change complex sentences into shorter ones.

*Insert devices that help you buy time to plan what to say next(pauses and fillers like um, err, ah)

*use coordinating conjunctions like and, but, or so instead of ones like although and whereas

*read about what you have written to see if it sounds natural.

*If you work from a recording, make a tape script. If you work from a tape script, make a recording.

*Build in pausing, redundancy, and other features of oral texts (false starts, ungrammatically, hesitations)[3]

Whenever possible try to use samples of authentic speech to assess listening. Other good sources include radio, television, pre-recorded teaching materials, pod casts, internet, and teacher-produced materials.

As researchers, we recommend that student have to know between 90-95 percent of the words to understand a text/script. Indeed the level of vocabulary that you utilize in your scripts can affect the difficulty and hence the comprehension of students. If your institution employs word lists, it is recommended that you seed vocabulary from your own word lists, into listening scripts whenever possible.

Item writing

Once you have decided on the texts and formats you are going to use, it is time to think about the individual test items. Listen to the passage and note areas you want students to understand from the input text. When you have done this, you are ready to start constructing items. Place test items sufficiently far apart in the test so that students have time to respond to one item without missing the next. For example, if answers fall too closely together in the text, students can miss one and fine themselves listening for responses that have long since passed.

Frame each new section with an advance organizer to help develop the context and activate students background knowledge. These examples prepare students for the listening texts:

Task 1: Listen to the interview with Dr. Peter Davidson, a specialist in sports medicine. He will give you his views on the advantages and advantages of extreme sports. Then answer the questions.

Task 2. Mr. and Mrs. Rollins, a young couple from New York City, are discussing their summer plans. Listen to their conversation and then answer the questions.

If you are using a script, build in and record specific instructions so that students know exactly how long they have for each step. This following is a sample of pre-recorded instructions for a listening test.

You have one minute to read the questions. Now start listening. Student hear task 1 recording You have 1 minute to read the questions. Student hear task 1 recording You have 30 minutes to write your answer Now listen again Students hear task 1 again

The length of listening test is generally determined by one of two things: the length of the tape or the number of repetitions of the texts. Most published listening tests do not require attention to timing. The proctor simply inserts the tape or CD into the machine, and the

test is over when a pre-recorded. This is the end of the listening test statement is played. For teacher- produced listening tests, the timing of the test will usually be determined by how many times the test-takers are permitted to hear each passage. Proficiency tests like the TOEFL and IELTS allow students to hear the listening input passages one time, whereas achievement tests usually repeat the input twice. Buck recommends that if you are assessing main idea, input should be heard twice.[4] According to Carrol, listening tests should not exceed 30 minutes.[5]

Remember to give students time to pre-read the questions before the test and answer the questions throughout the test. If students are required to transfer their answer from the test paper to an answer sheet, extra time to do this should be built into the exam.

Conclusion

Valid and reliable testing of listening comprehension is a complex process. The teachers should keep these points in mind:

1. Reading texts must be converted to listening texts.

A written text lacks oral features. The closer a text is to oral language, the more appropriate it will be to assess students listening comprehension.

2. Gove credit for what students know

Don't deduct for spelling or grammar mistakes when your focus is on listening comprehension.

3. Don't forget the importance of background knowledge

Because students do not have multiple passes at the text, there needs to be sufficient contextualization prior to listening. To facilitate schema activation, set the context of the listening in the instructions.

4. Dont just test what is easy to test

Many teachers focus their test items on local information (e.g. numbers, dates, places) because these detail-focused items are easier to write than items that focus on meaning. Make sure your major focus is on meaning. Include higher-order thinking skills as well.

5. Don't expect full comprehension

Teachers should not expect students to remember everything they hear: students often comprehend without being able to remember content.

6. Accept that skill contamination will occur.

In a perfect world, reading would never interfere with the assessment of the listening skill. In reality, the successful completion of practically every listening test requires competent in other language skill areas. However, if the aim is to test listening, students should not be asked to read or write too much.

7. Assess all types of listening (top down/ bottom up and general /academic)

Vary your measures where listening comprehension is concerned.

8. Don't forget the cornerstones of good testing practice.

In listening, as in all the other skills, teachers should be guided by the cornerstones of testing; validity, reliability, practicality, washback, authenticity, transparency and security.

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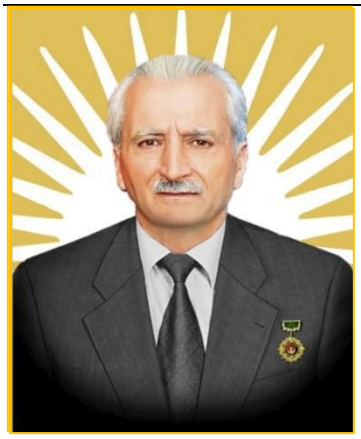

MADAD CHOBANOV AND ONOMALOGICAL ISSUES

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МАДАД ЧОБАНОВ И ОНОМАЛОГИЧЕСКИЕ ВОПРОСЫ

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MƏDƏD ÇOBANOV VƏ ONOMALOGİYA MƏSƏLƏLƏRİ

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Abstract

The article examines the scientific work of academician Madad Chobanov, who is known as a well-known Turkologist and public figure, an outstanding linguist-scientist, onomastician, especially an anthroponymist and toponymist, especially his research work in the field of onomology, and the reviews written about these works. It is noted that Madad Chobanov successfully defended his candidate dissertation on the topic "Lexicon of Azerbaijani Dialects of the Bolnisi Region of the Georgian SSR" at the Institute of Language and Literature of the Academy of Sciences of Uzbekistan in Tashkent in 1973, and in the same year he was elected a teacher at the Azerbaijani department of the Tbilisi State Pedagogical Institute named after A. S. Pushkin. He worked at this institution of higher education, later renamed the Tbilisi State Pedagogical University named after S. S. Orbeliani, and now Ilia University, for exactly 21 years, until 1994, as a lecturer, associate professor, professor, deputy head of department, and head of department.

Madad Chobanov successfully defended his doctoral dissertation on the topic "Fundamentals of Azerbaijani anthroponymy" at Baku State University in February 1992, was awarded the degree of Doctor of Philological Sciences, and was elected a professor in 1993. He has been continuing his scientific and pedagogical activities in Baku since 1994. He worked as vice-president of the "Futurologist" Continuous Education Complex, vice-rector of the Azerbaijan Futurology University, rector of the Azerbaijan Elite University, dean of the "Higher School Teachers" faculty at the Azerbaijan State Institute for Advanced Training and Retraining of Senior Pedagogical Personnel, and in 1996 was elected head of the "Languages" department at the Azerbaijan Higher Military School named after Heydar Aliyev - Azerbaijan Higher Naval School, and worked in that position with honor and dignity for many years.

Madad Chobanov (1937-2023), the author of more than 80 books, including 15 monographs, textbooks and teaching aids, more than 200 scientific articles, more than 250 scientific-publicistic writings, and dozens of works of art, gave speeches at international congresses, scientific-theoretical and scientific-practical conferences, symposiums, and seminars held in Azerbaijan, Georgia, Turkey, Russia, and the Central Asian republics. Dozens of his scientific articles and books have been published in those same countries.

Academician Madad Chobanov's works were read by prominent scientists, famous specialists and public figures, including the world-famous writer, well-known Turkologist Chingiz Aitmatov, Academician Edhem Rahimovich Tenishyev (Moscow), Academician Shanazar Shaabdurakhmanovich Shaabdurakhmanov (Dashkand), well-known scientists of Uzbekistan - professors Nasir Shukurov, Etibarkhanim Nasirova, Fattoh Abdullayev, Kayum Kayumov, Kazakh scientist - Ali Abbas Chinar, Kyrgyz scientist Gulzura Jumakanova, Turkish scientists - Hamza Zulfikar, Cengiz Alyilmaz, Dogan Gaya, Fazil Ergash, Metin Kara, Shuraddin Mammadli, Gulnara Goja-Mammadova, as well as Azerbaijani scientists - Abdulazal Demirchizade, Afad Gurbanov, Alovsat Abdullayev, Ramiz Mehdiyev, Hasan Mirzayev, Nizami Jafarov, Musa Adilov, Sayyara Mollazade, It was highly appreciated by Hasrat Hasanov, Kamil Valiyev, Shamil Gurbanov, Yusif Seyidov, Nizami Khudiyev, Aflatun Sarajly (Mammadov), Tofig Ahmadov, Gazanfar Kazimov, Nabi Asgarov, Ibrahim Bayramov, Azizkhan Tanrverdi, Buludkhan Khalilov, Aslan Aslanov, Fidan Gurbanova, Sevindik Veliyev, Chingiz Huseynzade, Razim Mammadli, Ali Rza Khalafli, Sadiq Zaman and others.

The article focuses on the works of only one of these scientists - the former head of the "Methodology of Teaching the Azerbaijani Language" department of the Azerbaijan State Pedagogical University, Doctor of Philological Sciences, the late Professor Azizkhan Tanriverdi, which are well known to the scientific community, refers to his writings about academician Madad Chobanov, and briefly presents to the readers the services rendered by M. Chobanov in the field of onomology. It is shown that in the work of academician Madad Chobanov, the Azerbaijani language, Azerbaijani studies, Turkology, the unity of Turkic literary languages, linguistics, dialectology, linguistics, onomastics, especially anthroponymy and toponymy, as well as literary studies, literary

relations, including the literary, artistic and scientific embodiment of the traditions of friendship and brotherhood of the Azerbaijani and Georgian peoples, etc. factors have reached a new level, found their broad reflection in scientific thinking, ensured a longer life for the author in science, and thus, Azerbaijani linguistics and Azerbaijani literary studies, in general, the science of Turkology and philology, as well as Azerbaijani-Georgian literary relations, have become even richer.

Аннотация

В статье рассматривается научная работа академика Мадада Чобанова, известного как выдающийся тюрколог и общественный деятель, видный лингвист-ученый, ономастик, в особенности антропонимист и топонимист, в частности, его исследовательская работа в области ономологии, а также рецензии на эти работы. Отмечается, что Мадад Чобанов (1937-2023) успешно защитил кандидатскую диссертацию на тему "Лексикон азербайджанских говоров (диалектов) Болнисского района Грузинской ССР" в Институте языка и литературы Академии наук Узбекистана в Ташкенте в 1973 году, и в том же году был избран преподавателем в азербайджанском секторе Тбилисского государственного педагогического института имени А. С. Пушкина. Он проработал в этом высшем учебном заведении, позже переименованном в Тбилисский государственный педагогический университет им. С. С. Орбелиани, а ныне в Университет Ильи, ровно 21 год, до 1994 года, в качестве преподавателя, доцента, профессора, заместителя заведующего кафедрой и заведующего кафедрой.

Мадад Чобанов успешно защитил докторскую диссертацию на тему «Основы азербайджанской антропонимии» в Бакинском государственном университете в феврале 1992 года, получил степень доктора филологических наук и был избран профессором в 1993 году.

С 1994 года он продолжил свою научно-педагогическую деятельность в Баку. Он работал вице-президентом комплекса непрерывного образования «Футуролог», проректором Азербайджанского университета футурологии, ректором Азербайджанского элитного университета, деканом факультета «Высшие педагогические учителя» Азербайджанского государственного института повышения квалификации и переподготовки старших педагогических кадров, а в 1996 году был избран заведующим кафедрой «Языки» Азербайджанского высшего военного училища имени Гейдара Алиева – Азербайджанского высшего военно-морского училища, и с честью и достоинством проработал на этой должности много лет.

Мадад Чобанов, автор более 80 книг, включая 15 монографий, учебников и пособий, более 200 научных статей, более 250 научно-публицистических работ и десятков литературных и художественных произведений, выступал с докладами на международных конгрессах, научно-теоретических и научно-практических конференциях, симпозиумах и семинарах, проходивших в Азербайджане, Грузии, Турции, России и республиках Центральной Азии. Десятки его научных статей и книг были опубликованы в этих же странах.

Очень высоко оценили труды академика Мадада Чобанова выдающиеся ученые, известные специалисты и общественные деятели, в том числе всемирно известный писатель и тюрколог Чингиз Айтматов, академик Эдем Рахимович Тенишев (Москва), академик Шаназар Шаабдурахманович Шаабдурахманов (Дашкенд), известные ученые из Узбекистана - профессора Насир Шукуров, Этибарханым Насирова, Фаттох Абдуллаев, Каюм Каюмов, Казахский ученый - Али Аббас Чинар, Кыргызский ученый Гульзура Джумаканова, Турецкие ученые - Хамза Зульфикар, Чингиз Алылмаз, Доган Гая, Фазиль Эргаш, Метин Кара, Шураддин Мамедли, Гульнара Годжа-Мамедова, а также Азербайджанские ученые - Абдулазал Демирчизаде, Афад Гурбанов, Аловсат Абдуллаев, Рамиз Мехтиев, Гасан Мирзаев, Низами Джафаров, Муса Адилов, Сайяра Моллазаде, Хасрат Гасанов, Камиль Велиев, Шамиль Гурбанов, Юсиф Сеидов, Низами Худиев, Афлатун Сараджлы (Мамедов), Тофик Ахмедов, Газанфар Кязимов, Наби Аскеров, Ибрагим Байрамов, Азизхан Танрверди, Булудхан Халилов, Аслан Асланов, Фидан Гурбанова, Севиндик Велиев, Чингиз Гусейнзаде, Разим Мамедли, Али Рза Халафли, Садик Заман и другие.

В статье рассматриваются работы только одного из этих ученых - бывшего заведующего кафедрой «Методологии преподавания азербайджанского языка» Азербайджанского государственного педагогического университета, доктора филологических наук, покойного профессора Азизхана Танриверди, хорошо известных научному сообществу, приводятся ссылки на его труды об академике Мададе Чобанове и кратко представлены читателю заслуги М. Чобанова в области ономологии. Показано, что в творчестве академика Мадада Чобанова азербайджанский язык, азербайджановедение, тюркология, единство тюркских литературных языков, лингвистика, диалектология, ономастика, особенно антропонимия и топонимия, а также литературоведение, литературные связи, включая литературное, художественное и научное воплощение традиций дружбы и братства азербайджанского и грузинского народов и др., достигли нового уровня, нашли широкое отражение в научном мышлении, обеспечили автору более долгую жизнь в науке, и таким образом азербайджанская лингвистика и азербайджановедение в целом, наука тюркология и филология, а также азербайджано-грузинские литературные связи, стали еще богаче.

Xülasə

Məqalədə tanınmış türkoloq və ictimai xadim, görkəmli dilçi-alim, onomastikaşünas, xüsusilə də, antroponimist və toponomist alim kimi məşhur olan akademik Mədəd Çobanovun elmi yaradıcılığı, xüsusilə də, onomalogiya sahəsində apardığı tədqiqat işləri və həmin əsərlər haqqında yazılmış rəylər araşdırılır. Qeyd olunur ki, Mədəd Çobanov 1973-cü ildə Daşkənddə Özbəkistan EA-nın Dil və Ədəbiyyat İnstitutinda *"Gürcüstan SSR*

Bolnisi rayonu Azərbaycan şivələrinin leksikası" mövzusunda namizədlik dissertasiyasını müvəffəqiyyətlə müdafiə etmiş, elə həmin ildən də A. S. Puşkin adına Tbilisi Dövlət Pedaqoji İnstitutunun Azərbaycan bölməsinə müəllim seçilmişdir. Sonralar S.S.Orbeliani adına Tbilisi Dövlət Pedaqoji Universiteti, hazırda isə İlya Unuversiteti adlanan həmin ali təhsil ocağında 1994-cü ilədək düz 21 il - müəllim, dosent, professor, kafedra müdirinin müavini və kafedra müdiri vəzifələrində çalışmışdır.

Mədəd Çobanov 1992-ci ilin fevralında Bakı Dövlət Universitetində *"Azərbaycan antroponimiyasının əsasları"* mövzusunda doktorluq dissertasiyasını uğurla müdafiə etmiş, *filologiya elmləri doktoru* elmi dərəcəsinə layiq görülmüş, 1993-cü ildə *professor* seçilmişdir. O, 1994-cü ildən elmi-pedaqoji fəaliyyətini Bakıda davam etdirmirdir. *"Futuroloq"* Fasiləsiz Təhsil Kompleksində vitse-prezident, Azərbaycan Futurologiya Universitetində prorektor, Azərbaycan Elitar Universitetində rektor, Azərbaycan Dövlət Baş Pedaqoji Kadrların İxtisasının Artırılması və Yenidənhazırlanması İnstitutunda "Ali məktəb müəllimləri" fakültəsinin dekanı vəzifələrində çalışmış, 1996-cı ildə Heydər Əliyev adına Azərbaycan Ali Hərbi Məktəbində - Azərbaycan Ali Hərbi Dənizçilik Məktəbində "Dillər" kafedrasının müdiri seçilmiş və uzun illər həmin vəzifədə şərəf və ləyaqətlə çalışmışdır.

80-dən çox kitabın, o cümlədən, 15 monoqrafiya, dərslik və dərs vəsaitlərinin, 200-dən çox elmi məqalənin, 250-dən çox elmi-publisist yazının, onlarla bədii əsərlərin müəllifi olan Mədəd Çobanov (1937-2023) Azərbaycanda, Gürcüstanda, Türkiyədə, Rusiyada və Orta Asiya respublikalarında keçirilmiş Beynəlxalq qurultaylarda, elmi-nəzəri və elmi-praktik konfranslarda, simpoziumlarda, seminarlarda məruzələrlə çıxışlar etmişdir. Onlarla elmi məqalələri və kitabları elə həmin ölkələrdə də çap olunmuşdur.

Akademik Mədəd Çobanovun əsərlərini görkəmli alimlər, məşhur mütəxəssislər və ictimai xadimlər, o cümlədən, dünya şöhrəti qazanmış görkəmli yazıçı, tanınmış türkoloq Çingiz Aytmatov, akademik Edhem Rahimoviç Tenişyev (Moskva), akademik Şanazar Şaabduraxmanoviç Şaabduraxmanov (Daşkənd), Özbəkistanın tanınmış alimləri - professorlar Nəsir Şükürov, Etibarxanım Nasirova, Fattoh Abdullayev, Kayum Kayumov, Qazaxstan alimi - Ali Abbas Çinar, Qırğızıstan alimi Gülzura Cumakanova, Türkiyə alimləri - Hamza Zülfikar, Cengiz Alyılmaz, Doğan Qaya, Fazıl Erqaş, Metin Kara, Şurəddin Məmmədli, Gülnara Qoca-Məmmədova, həmçinin Azərbaycan alimlərindən - Əbdüləzəl Dəmirçizadə, Afad Qurbanov, Əlövsət Abdullayev, Ramiz Mehdiyev, Həsən Mirzəyev, Nizami Cəfərov, Musa Adilov, Səyyarə Mollazadə, Həsrət Həsənov, Kamil Vəliyev, Şamil Qurbanov, Yusif Seyidov, Nizami Xudiyev, Əflatun Saraclı (Məmmədov), Tofiq Əhmədov, Qəzənfər Kazımov, Nəbi Əsgərov, İbrahim Bayramov, Əzizxan Tanrverdi, Buludxan Xəlilov, Aslan Aslanov, Fidan Qurbanova, Sevindik Veliyev, Çingiz Hüseynzadə, Razim Məmmədli, Əli Rza Xələfli, Sadiq Zaman və başqaları çox yüksək qiymətləndirmişlər.

Bu məqalədə isə həmin alimlərdən ancaq bir nəfərin - Azərbaycan Dövlət Pedaqoji Universitetinin "Azərbaycan dilinin tədrisi metodikası" kafedrasının sabiq müdiri, flologiya elmləri doktoru, mərhum professor Əzizxan Tanriverdinin elmi ictimaiyətə yaxşı məlum olan əsərlərinə diqqət yetirilir, onun akademik Mədəd Çobanov haqqında yazdıqlarına istinad edilir və M.Çobanovun onomalogiya sahəsində göstərmiş olduğu xidmətləri, qısaca da olsa, bir daha oxuculara təqdim edilir. Göstərilir ki, akademik Mədəd Çobanovun yaradıcılığında Azərbaycan dili, Azərbaycanşünaslıq, türkologiya, türk ədəbi dillərinin birliyi, dilçilik, dialektologoiya, linqvistika, onomastika, xüsusilə də, antroponimika və toponimika, eləcə də, ədəbiyyatşünaslıq, ədəbi əlaqələr, o cümlədən, Azərbaycan və gürcü xalqlarının dostluq və qardaşlıq ənənələrinin ədəbi-bədii və elmi ədəbiyyatda təcəssümü və s. amillər yeni müstəviyə keçmiş, elmi təfəkkürdə öz geniş əksini tapmış, müəllifinin elmdə daha uzun ömür sürməsini təmin etmiş və beləliklə də, Azərbaycan dilçiliyi və Azərbaycan ədəbiyyatşünaslığı, ümumi olaraq, türkologiya və filologiya elmi, həmçinin, Azərbaycan-gürcü ədəbi əlaqələri daha da zənginləşmişdir.

Keywords: Azerbaijani language, linguistics, Turkology, onomastics, anthroponymy, toponymy, Madad Chobanov, Azizkhan Tanriverdi

Ключевые слова: Азербайджанский язык, лингвистика, тюркология, ономастика, антропонимия, топонимия, Мадад Чобанов, Азизхан Танриверди

Açar sözlər: Azərbaycan dili, dilçilik, türkologiya, onomastika, antroponimika, toponimika, Mədəd Çobanov, Əzizxan Tanrıverdi

Giriş

Tanınmış türkoloq və ictimai xadim, görkəmli dilçi-alim, onomastikaşünas, xüsusilə də, antroponimist və toponomist alim kimi məşhur olan Mədəd Çobanov (1937-2023) olduqca mənalı bir ömür sürmüş, harada yaşamasından və işləməsindən asılı olmayaraq, həmişə şərəflə yaşamış, ləyaqətlə çalışmış, sıravi orta məktəb müəllimliyindən ali məktəbin müəllimi, dosenti, professoru, kafedra müdiri, dekanı və rektoru vəzifələrinə qədər yüksəlmiş, gərgin əməyi, böyük zəhməti, geniş və əhatəli, elmi-pedaqoji və ictimai fəaliyyəti, zəngin və dəyərli yaradıcılığı sayəsində ən yüksək elmi dərəcəyə - *filologiya elmləri doktoru* elmi dərəcəsinə, ən yüksək elmi adlara - *professor* və *akademik* elmi adlarına layiq görülmüşdür.

Akademik Mədəd Çobanov Azərbaycanda, Gürcüstanda, Türkiyədə, Rusiyada və Orta Asiya respublikalarında keçirilmiş Beynəlxalq qurultaylarda, elmi-nəzəri və elmi-praktik konfranslarda, simpoziumlarda, seminarlarda məruzələrlə çıxışlar etmişdir. Onlarla elmi məqalələri və kitabları həmin ölkələrdə çap olunmuşdur.

Akademik Mədəd Çobanovun əsərləri görkəmli alimlər, məşhur mütəxəssislər və ictimai xadimlər, o cümlədən, dünya şöhrəti qazanmış görkəmli yazıçı,

tanınmış türkoloq Çingiz Aytmatov, akademik Edhem Rahimoviç Tenişyev (Moskva), akademik Şanazar Şaabduraxmanoviç Şaabduraxmanov (Daşkənd), Özbəkistan alimləri – professorlar Nəsir Şükürov, Etibarxanım Nasirova, Fattoh Abdullayev, Kayum Kayumov, Qazaxstan alimi - Ali Abbas Çinar, Qırğızıstan alimi Gülzura Cumakanova, Türkiyə alimləri - Hamza Zülfikar, Cengiz Alyılmaz, Doğan Kaya, Fazıl Erqaş, Metin Kara, Şurəddin Məmmədli, Gülnara Qoca-Məmmədova, həmçinin Azərbaycan alimlərindən - Əbdüləzəl Dəmirçizadə, Afad Qurbanov, Əlövsət Abdullayev, Ramiz Mehdiyev, Həsən Mirzəyev, Nizami Cəfərov, Musa Adilov, Səyyarə Mollazadə, Həsrət Həsənov, Kamil Vəliyev, Şamil Qurbanov, Yusif Seyidov, Əflatun Saraclı (Məmmədov), Tofiq Əhmədov, Qəzənfər Kazımov, Nizami Xudiyev, Nəbi Əsgərov, İbrahim Bayramov, Əzizxan Tanrverdi, Buludxan Xəlilov, Aslan Aslanov, Fidan Qurbanova, Sevindik Veliyev, Çingiz Hüseynzadə, Razim Məmmədli, Əli Rza Xələfli, Sadiq Zaman və başqaları tərəfindən yüksək qiymətləndirilmişdir.

Biz bu məqaləmizdə həmin alimlərdən ancaq bir nəfərin – Azərbaycan Dövlət Pedaqoji Universitetinin "Azərbaycan dilinin tədrisi metodikası" kafedrasının sabiq müdiri, flologiya elmləri doktoru, mərhum professor Əzizxan Tanriverdinin elmi ictimaiyətə yaxşı məlum olan əsərlərinə diqqət yetirir, onun akademik Mədəd Çobanov haqqında yazdıqlarına istinad edir və M.Çobanovun onomalogiya sahəsində göstərmiş olduğu xidmətlərini, qısaca da olsa, bir daha oxuculara təqdim edirik.

Tədqiqat

Professsor Ə.Tanrıverdi *"Şərqin səsi"* (N: 03 (198), fevral, 2007) və *"Hakimiyyət və gələcək"* (N: 06 (146), 04 aprel, 2007) qəzetlərində dərc olunmuş *"Mədəd Çobanov və onomalogiya məsələləri"* sərlövhəli məqaləsini belə bir girişlə başlayır:

"Azərbaycan elm və mədəniyyəti tarixində bir neçə sahə üzrə çalışan və onların hər birində uğurlar qazanan görkəmli şəxsiyyətlər çox olub. Müasir dövrdə də ensiklopedik bilik sahibi olan, fəaliyyət dairəsi zənginliyi ilə fərqlənən şəxsiyyətlərimiz az deyil. Belə simalardan biri də alim, müəllim, publisist və tərcüməçi kimi ən azı türk dünyası və MDB məkanında tanınan, əsərləri Azərbaycan, türk, özbək, qazax, qırğız, rus, gürcü, erməni və digər dillərdə çap olunan akademik Mədəd Çobanovdur. O, hansı sahədə çalışmasından və yazmasından asılı olmayaraq, türk böyüklüyünü, türk qüdrətini, onun zəngin olan dilini, tarixini və etnoqrafiyasını həmişə diqqət mərkəzində saxlayıb." *(Tanrıverdi, Ə., 2007)* Bu cəhət müəllifin müxtəlif illərdə çap olunmuş *"Azərbaycanşünaslığın əsasları", "Azərbaycan onomastikası", "Azərbaycan antroponimiyasının əsasları", "Borçalı toponimləri", "Borçalı şivələrinin leksikası", "Mətnin linqvistik təhlili", "Pedaqoji məsələlər", "Türk dillərinin ədəbi birliyinə doğru", "Dədə Qorqud - Qəhrəmanlıq dastanı", "Ədəbi düşüncələr", "Dilçilik məsələləri"* və s. adda olan 80-dən çox kitabında, o cümlədən, 15 monoqrafiyada, dərslik və dərs vəsaitlərində, müəllifi olduğu 200-dən çox elmi məqaləsində, 250-dən çox elmi-publisist yazısında və s. əsərlərində özünü parlaq şəkildə göstərir.

Məqalədə Mədəd müəllimin mənalı ömür yolunun səhifələri vərəqlənir, qeyd olunur ki, Mədəd Namaz oğlu Çobanov - 1937-ci il aprelin 11-də qədim Borçalı mahalında – indiki Gürcüstanın Bolnisi rayonundakı Darbaz kəndində anadan olmuş, A. S. Puşkin adına Tbilisi Dövlət Pedaqoji İnstitutunu bitirmiş, doğma Darbaz kənd orta məktəbində pedaqoji fəaliyyətə başlamış, bir il müəllim işlədikdən sonra əsgəri xidmətə yollanmış, Zabitlər məktəbini bitirmiş, baş leytenant rütbəsində ordudan ehtiyat buraxıldıqdan sonra, bir il Bolnisi rayon komsomol komitəsində çalışmış, sonra irəli çəkilmiş, fəaliyyətini rayon partiya komitəsində davam etdirmişdir. Eyni zamanda, Azərbaycan Elmlər Akademiyasının İ. Nəsimi adına Dilçilik İnstitutunun aspiranturasında qiyabi təhsil almış, 1973-cü ildə Daşkənddə Özbəkistan Elmlər Akademiyasının Dil və Ədəbiyyat İnstitutinda *"Gürcüstan SSR Bolnisi rayonu Azərbaycan şivələrinin leksikası"* mövzusunda namizədlik dissertasiyasını müvəffəqiyyətlə müdafiə etmişdir. Elə həmin ildən də A. S. Puşkin adına Tbilisi Dövlət Pedaqoji İnstitutunun Azərbaycan bölməsinə müəllim seçilmişdir. Sonralar S.S.Orbeliani adına Tbilisi Dövlət Pedaqoji Universiteti, hazırda isə İlya Unuversiteti adlanan həmin ali təhsil ocağında 1994-cü ilədək düz 21 il - müəllim, dosent, professor, kafedra müdirinin müavini və kafedra müdiri vəzifələrində çalışmışdır.

Mədəd Çobanov 1992-ci ilin fevralında Bakı Dövlət Universitetində *"Azərbaycan antroponimiyasının əsasları"* mövzusunda doktorluq dissertasiyasını uğurla müdafiə etmiş, *filologiya elmləri doktoru* elmi dərəcəsinə layiq görülmüş, 1993-cü ildə isə *professor* seçilmişdir.

O, 1994-cü ildən elmi-pedaqoji fəaliyyətini Bakıda davam etdirmirdir. *"Futuroloq"* Fasiləsiz Təhsil Kompleksində vitse-prezident, Azərbaycan Futurologiya Universitetində prorektor, Azərbaycan Elitar Universitetində rektor, Azərbaycan Dövlət Baş Pedaqoji Kadrların İxtisasının Artırılması və Yenidənhazırlanması İnstitutunda "Ali məktəb müəllimləri" fakültəsinin dekanı vəzifələrində çalışmışdır.

1996-cı ildə Heydər Əliyev adına Azərbaycan Ali Hərbi Məktəbində - Azərbaycan Ali Hərbi Dənizçilik Məktəbində "Dillər" kafedrasının müdiri seçilmiş, uzun illər, daha dəqiq desək, təqaüdə çıxana kimi həmin vəzifədə şərəf və ləyaqətlə çalışmışdır.

Müxtəlif illərdə Azərbaycan Dövlət Pedaqoji Universitetində və Azərbaycan Texniki Universitetində də dərs demiş, mühazirələr oxumuşdur.

Yüzlərlə müəllimin, onlarla alimin yetişməsində böyük əmək sərf etmiş, onların bir neçəsinin elmi rəhbəri, məsləhətçisi, opponenti və ya rəyçiləri olmuşdur.

Mədəd Çobanov uzun müddət Azərbaycan Respublikası Prezidenti yanında Ali Attestasiya Komissiyasının Ekspert Şurasının üzvü olmuşdur.

O, Türk Dil Kurumunun üzvü, Beynəlxalq Turan Akademiyasının və Nyu-York Elmlər Akademiyasının akademiki - həqiqi üzvü seçilmişdir.

Professor Mədəd Çobanov S.S.Orbeliani adına Tbilisi Dövlət Pedaqoji Universitetinin Azərbaycan dili və ədəbiyyatı kafedrasına rəhbərlik etdiyi müddətdə həmin kafedranın nəzdində *"Qaynaq"* Ədəbi birliyini,

Azərbaycan Ali Hərbi Dənizçilik Məktəbinin "Dillər" kafedrasının müdiri olduğu zaman isə həmin kafedranın nəzdində *"Dalğalar qoynunda"* adlı Ədəbi birlik yaratmış, uzun müddət həmin birliklərə rəhbərlik etmiş və eyni zamanda *"Dalğalar qoynunda"* adlı qəzetin redaktoru olmuş, iki cildlik *"Ədəbi düşüncələr"* adlı kitabı ilə ədəbi tənqidçi kimi böyük nüfuz qazanmışdır.

O, ilk dəfə *"Azərbaycanca-gürcücə danışıq lüğəti"* tərtib etmiş (Tbilisi, 1977, 1991, Bakı, 2000), *"Sevirəm Gürcüstanı"* (Bakı, 1977), *"Dostluq tərənələri"* (gürcü dilində, Tbilisi, 1978), *(həmçinin, 2 cildlik "Azərbaycan-gürcü ədədi əlaqələri" (Bakı, 2017, 2019) – M.B.)* və s. kitabları ilə iki qonşu xalq arasında dostluq əlaqələrinin daha da inkişaf etdirilməsinə xidmət etmişdir.

Mədəd Çobanov gənclik illərindən bədii yaradıcılıqla da məşğul olmuş, bir dramın, iki pyesin, iki povestin, bir dastanın, onlarla hekayələrin müəllifidir. Əsərləri türk, rus, gürcü, özbək, ingilis, fransız və s. dillərə tərcümə olunmuşdur.

Özü də rus və gürcü dillərindən bir neçə əsəri Azərbaycan dilinə tərcümə etmişdir.

Əzizxan Tanrıverdi yazır:

"Mədəd Çobanov müəllimlə alimliyi, nəzəriyyə ilə praktikanı sintez edə bilən tədqiqatçılarımızdandır. Burada təkcə bir məsələni qeyd edək ki, görkəmli alimin hərbi məktəbdə bir professor, həm də kafedra müdiri vəzifəsində çalışması onu qədim türk hərb sənəti ilə bağlı yazılar yazmağa sövq etmişdir. Onun Müşfiq Çobanlı ilə birlikdə çap etdirdiyi "Dədə Qorqud dünyasına səyahətdən parçalar" (Bakı, 1998) adlı monoqrafiyanın II hissəsindəki "Qalın Oğuz eli və hərb sənəti", "Qalın Oğuz igidləri və onların döyüş taktikası", "Qalın Oğuz eli və hərbi marşlar" və s. kimi bölmələr də dediklərimizi təsdiqləyir.

Türkologiyada, o cümlədən Azərbaycan dilçiliyində bir neçə istiqamət üzrə tədqiqat aparan alimlərin sırasında Mədəd Çobanovun xüsusi yeri var." *(Tanrıverdi, Ə., 2007)*

Akademik Əbdüləzəl Dəmirçizadə (Bakı) çox haqqlı olaraq yazmışdır: "Mədəd Çobanov Azərbaycan dilinin müasir problemlərini milli təəssübkeşlik və təşəbbüskarlıq baxımdan araşdıran ilk alimlərimizdən biridir". Onun antronimiya, toponimiya, dialektologiya, leksikoqrafiya və digər sahələr üzrə çap etdirdiyi çoxsaylı məqalə, monoqrafiya və lüğətləri sanbalına, yüksək elmi dəyərinə görə bu gün mütəxəssislər tərəfindən razılıqla qarşılanır, onlara bir mənbə kimi istinad olunur. Heç şübhəsiz ki, sonrakı yüzilliklərdə də belə olacaqdır.

"Antroponimika problemləri Mədəd Çobanovun ən çox müraciət etdiyi mövzulardandır." *(Tanrıverdi, Ə., 2007)* O, ilk dəfə olaraq "Azərbaycan şəxs adları" *(Bakı: "Maarif", 1981, 36 səh.)* lüğətini tərtib etmiş, geniş bir ön söz yazmış və ayrıca kitabça şəklində çap etdirərək oxucuların ixtiyarına vermişdir. *(http://web2.anl.az:81/-read/page.php?bibid=vtls000193141)* Həmin kitab 1993-cü ildə "Azərbaycan kişi adları" adı ilə Türkiyədə də çap olunmuşdur.

Filologiya elmləri doktoru, professor Əzizxan Tanrıverdi *"Türk mənşəli Azərbaycan antroponimləri" (1996), "Kitabi-Dədə Qorqud"da şəxs adları" (1999), "XVI əsr qıpçaq (poloves) dilinin qrammatikası" (2000), "Kitabi-Dədə Qorqud və qərb ləhcəsi" (2002), "Kitabi-Dədə Qorqud"un obrazlı dili" (2006), "Kitabi-Dədə Qorqud"un söz dünyası" (2007), "Dədə-Qorqud kitabı"nın dil möcüzəsi" (2008), "Dilimiz, mə-nəviyyatımız" (2008), "Qədim türk mənbələrində yaşayan şəxs adları" (2009), "Azərbaycan dilinin tarixi qrammatikası" (2010)* və digər əsərlərində olduğu kimi, *"Türk mənşəli Azərbaycan şəxs adlarının tarixi-linqvistik tədqiqi" (Bakı, 2012, https://anl.az/el/Kitab/92429.pdf)* adlı kitabında da akademik Mədəd Çobanovun elmi tədqiqat işlərinə geniş yer ayırmış və qeyd etmişdir ki, "Mədəd Çobanov Azərbaycan antroponimikasının müxtəlif cəhətləri ilə bağlı bir sıra tezis, məqalə və monoqrafiya çap etdirmişdir. Onun hələ 1983-cü ildə çap olunan "Azərbaycan antroponimiyasının əsasları" kitabında antroponimlərin leksik-semantik qrupları, quruluşu, adqoyma ənənələrindən bəhs edilir, köməkçi ad kateqoriyalarından təxəllüs və ləqəbin leksiksemantik xüsusiyyətləri və s. məsələlər zəngin dil faktları ilə təsdiqlənir. Burada diqqəti cəlb edən məsələlərdən biri də müştərək adlar, polinim və polindromik adlar, adların abbreviasiyası kimi məsələlərin geniş şəkildə tədqiqata cəlb edilməsidir." *(Tanrıverdi, Ə. 2012, səh.28)*

Mədəd Çobanov ilk dəfə olaraq pedaqoji universitetlərin filologiya fakültələrinin tədris planında nəzərdə tutulmuş *"Dilçilikdən xüsusi kurs"* proqramı əsasında 1981-ci ildə *"Azərbaycan antroponimiyasının əsasları"* adlı proqram, 1983-cü ildə isə *"Azərbaycan antroponimiyasının əsasları"* adlı dərs vəsait hazırlamışdır. Həmin proqram və dərs vəsaiti Gürcüstan Təhsil Nazirliyi tərəfindən təsdiq olunduqdan sonra Tbilisidəki "Qanatleba" nəşriyyatında nəşr edilmişdir.

Mədəd Çobanov Azərbaycan antroponimiyası ilə bağlı tədqiqatlarını sonralar da davam etdirmiş, bu mövzuda doktorluq dissertasiyası yazmış və 1992-ci ilin fevralında həmin dissertasiyanı ("Azərbaycan antroponimikasının əsasları, DDA, Bakı, 1992), "Os-novı azepbaydjanskoy antpoponimiki" (ADD, Baku, 1992)) Bakı Dövlət Universitetində uğurla müdafiə etmiş *(Tanrıverdi, Ə., 2012, s.29),* ona keçmiş SSRİ Ali Attestasiya Komissiyası tərəfindən filologiya elmləri doktoru elmi dərəcəsi verilmiş, 1993-cü ilin oktyabr ayında isə professor seçilmişdir. *(Həmin diplom və attestat 1995-ci ildə Azərbaycan Respublikasının Prezidenti yanında Ali Attestasiya Komissiyası tərəfindən nostrifikasiyadan keçmiş və təkrar təsdiq edilmişdir. – M.B.)* "Bu onun Azərbaycan antroponimlərinin tədqiqinə xüsusi maraq göstərdiyini sübut edir. Məhz həmin əsərlərə görə Mədəd Çobanovun adı türkologiyada N.A.Baskakov, E.Beqmatov, N.Qarbova, T.Jamzakov kimi, Azərbaycan dilçiliyində A.Qurbanov, M.Adilov, H.Əliyev kimi alimlərlə bir sırada çəkilir." *(Tanrıverdi, Ə., 2007)*

"Mədəd Çobanov olduqca aktual və həllinə zəruri ehtiyac hiss olunan problemin işlənməsini qarşıya məqsəd qoyub, dilimizdəki şəxs adlarının əmələ gəlməsini, yayılma regionunu, istifadə dərəcəsini, inkişaf tarixini və s. cəhətlərini araşdırmağa çalışmışdır... Son illərə qədər meydana gəlmiş elmi-

tədqiqat işləri təhlil olunur, hər bir fikrin, mülahizənin elmi qiyməti verilir. Müxtəlif illərin məhsulu olan hər bir əsər elmi süzgəcdən keçirilərkən müəllifin xronoloji prinsipi gözlədiyi, onun obyektiv mövqe tutduğu müsbət hal kimi diqqəti cəlb edir. Müəllif onomastikaya dair istər respublikamızda, istərsə də ondan kənarda keçirilən konfranslarda qoyulan məsələlərə də toxunur, əlaqədar məsələlərin təhlilini verir, əldə olunan ümumi elmi baxışları, nəticələri faydalı hesab edir... Ümumiyyətlə, əsərdə ayrı-ayrı dövrlərin ictimai-siyasi vəziyyətinin, mədəni səviyyəsinin nəzərə alınması dil faktlarının düzgün şərh edilməsinə əsas vermiş, dissertasiyanın elmi keyfiyyətinin artmasına səbəb olmuşdur... Dissertasiyanın bütün fəsillərində dilçiliyin nəzəri bünövrəsinə uyğun olan bir sıra xüsusi elmi metodlardan istifadə edilmişdir. Müasir dilçiliyin müqayisəli, tarixi və kəmiyyət metodlarına daha çox müraciət olunması əsərin keyfiyyətini daha da artırmış, müəllifin məqsədinə nail olmasına imkan yaratmışdır. Mədəd Çobanovun bu əsəri, həqiqi mənada, dərin araşdırmaların və gərgin əməyin məhsuludur... Bu əsəri türkoloji dilçilikdə antroponimiya məsələlərinə dair zəngin dil materialları üzərində qurulmuş orijinal tədqiqat işi kimi qiymətləndirmək olar. Əsərin müsbət məziyyətləri çoxdur. *(Qurbanov, Afad. M.Çobanovun doktorluq dissertasiyasına yazılmış rəsmi opponent rəyindən. Bax: Cəfərov, N., 2012, s.65)*

"Azərbaycan dilşiliyində lüğət tərkibinin geniş bir sahəsini əhatə edən antroponimlər bu vaxta qədər ayrıca tədqiqat mövzusu kimi monoqrafik planda öyrənilməmişdir. Doktorant bu mövzunu seçərkən şəxs adlarının inkişaf şəraitini, dil rəngarəngliyini və bir sıra başqa mühüm səciyyəvi cəhətləri nəzərə almışdır. Dissertasiyanın məzmunu göstərir ki, M.Çobanovun elmi-nəzəri cəhətdən müşahidəçilik qabiliyyəti, müstəqil tədqiqatçılıq vərdişi və türkoloji hazırlığı vardır... Ümumiyyətlə, dissertasiya böyük zəhmət tələb edən bir əməyin məhsuludur. Dissertasiyanın müsbət cəhətlərindən biri kimi bunu xüsusi qeyd etmək istəyirik ki, tədqiqat işinin bütün fəsilləri arasında qarşılıqlı əlaqə, elmi-məntiqi ardıcıllıq və üzvi bağlılıq vardır..." *(Mollazadə, Səyyarə. M.Çobanovun doktorluq dissertasiyasına yazılmış rəsmi opponent rəyindən. Bax: Cəfərov, N., 2012, s.66)*

Mədəd Çobanovun doktorluq dissertasiyası əsasında hazırladığı *"Azərbaycan antroponimiyasının əsasları"* kitabı 1995-ci ildə Bakıda *"Azərbaycan"* nəşriyyatı tərəfindən rus dilində ("Основы азербайджанской антропонимики", Баку, "Азербайджан", 1995, 332 ст.) nəşr olunaraq geniş oxucu kütləsinin ixtiyarına verilmişdir. 1998-ci ildə Azərbaycan Respublikası Təhsil Nazirliyi tərəfindən ali məktəblər üçün dərs vəsaiti kimi təsdiq olunmuş və *"Maarif"* nəşriyatı tərəfindən nəşr edilmişdir. *(Çobanov M.N. Azərbaycan antroponimiyasının əsasları. Elmi redaktoru: akademik Afad Qurbanov, rəyçisi: professor Qəzənfər Kazımov. Bakı: "Maarif", 1998, səh. 332 - https://dilcilik.az/kitabxana/arasdirmalar/M%C9%99d%C9%99d%20%C3-%87obanov_%20Az%C9%99rbaycan%20Antroponimiyas%C4%B1n%C4%B1n%20C9%99saslar%C4%B1%20(1998).pdf)* Həmin kitabın yenidən hazırlanmış və əlavələr olunmuş üçüncü nəşri 2017-ci ildə "Borçalı" nəşriyyatı tərəfindən nəşr olunmuşdur. *(Çobanov M.N. Azərbaycan antroponimiyasının əsasları. Bakı: "Borçalı", 2017, səh. 412 -* http://web2.anl.az:-81/read/page.php?bibid=vtls000551626). Kitabda onomastika haqqında ümumi məlumat, antroponimika və onun tədqiqat obyekti, Azərbaycan dilçiliyində antroponimiyanın tədqiqi tarixi, antroponimlərin inkişafı məsələləri, ad və ad sistemi, familiya, təxəllüs, ləqəb, adların əsası və semantikası, antroponomik hadisələr - müştərək adlar, adqoyma ənənələri, adların quruluşu və mənşəyi, poetik antroponimiya və s. hərtərəfli təhlil olunmuşdur.

Mədəd Çobanov antroponimikanı onomologiyanın tədqiqat obyekti, sahələri və növlərinə də diqqət yetirir. Belə ki, müəllif onomalogiyanın tədqiqat obyektində xüsusi adların mənbəyi, yayılma dərəcəsi, predmətə uyğunluğu, üslubi imkanları və s. məsələlərin əsas olduğunu qeyd edir, onomalogiyanın antroponimika, toponimika, kosmonimika kimi sahələrindən bəhs edir, onomalogiyanın xüsusi və ümumi olmaqla 2 yerə bölünməsini ümumi dilçilik prizmasından şərh edir. Bu da onu göstərir ki, müəllif Azərbaycan antroponimlərinin diaxronik və sinxronik istiqamətdə təhlili üçün bir növ zəmin hazırlayır, təhlilin məhz həmin müstəvidə aparılmasını məqbul hesab edir. Digər tərəfdən, akademik Mədəd Çobanov Azərbaycan antronimik vahidlərinin tədqiqi tarixini sistemli şəkildə işləyərkən V.A.Qordlevski, A.N.Samoyloviç, A.Qurbanov, M.Adilov, Z.Sadıqov və başqalarının araşdırmalarına münasibət bildiirir, antroponimlərlə bağlı öyrənilməyən və ya tədqiqat obyekti kimi görülməyən problemləri dəqiqləşdirir. Belə bir metoddan istifadə isə müəllifə antroponimlərə aid ən incə detallara belə aydınlıq gətirməyə imkan verib.

Azərbaycan antroponimlərinin inkişaf tarixinə müxtəlif prizmalardan yanaşıldığını, antroponimlərin inkişaf mərhələsinə dair bir neçə fikrin irəli sürüldüyünü əsas götürən müəllif özünə qədərki araşdırmaları ümumiləşdirərək aşağıdakı sistemi təqdim edir:

Antroponimlərin inkişaf tarixi: qədim antroponimlər, atroponimlər orta əsrlərdə (XIII-XIX əsr) və müasir antroponimlər (XX əsr)

Araşdırmalar göstərir ki, müəllifin təqdim etdiyi bölgü elmi, həm də məntiqi baxımdan düzgündür. Digər tərəfdən, Mədəd Çobanov həmin dövrlər və ya mərhələlər üçün səciyyəvi olan antroponimik vahidləri dəqiqləşdirib. Məsələn, Alp, Qazan, Tanqrıstan, Ağvuqi, Arslan kimi antroponimlərin XII əsrə qədərki Azərbaycan antroponimləri baxımından xarakterik olması müəyyənləşdirilib. Yaxud Allahverdi, Ağası, Mədəd, Bəsdi, Güllü kimi antroponimlərin XVII-XIX əsrlər üçün səciyyəvi olması əsaslandırılıb.

Mədəd Çobanov xalqımızın tarixi, mədəniyyəti, etnoqrafiyası və dünyagörüşü ilə bağlı olan, milli etiket funksiyasını yerinə yetirən antroponimləri geniş şəkildə tədqiq edib. Məsələn, şəxsin ata adı ilə tanınmasından bəhs edərkən fikri təsdiq etmək üçün "Kitabi-Dədə Qorqud"a müraciət edib. (Qatğan oğlu Bayndur, Dərsə xanın oğlu Buğac) Deməli, müəllif antroponimik vahidlərə, həmçinin, onlara aid müxtəlif tipli modellərə tarixi-linqvistik prizmadan yanaşıb.

Mədəd Çobanovun tədqiqatlarında *"Azərbaycan antroponimlərinin sistemi"* mövzusu xüsusi yer tutur. Müəllif ata adı və familiyaları əsas ad kateqoriyaları sistemində araşdırarkən problemə diaxronik, xüsusən də sinxronik prizmadan yanaşıb. Kişi və qadın adları əsasında yaranan, həmçinin, kökü şəxs adı kimi izlənməyən sözlər əsasında düzələn familiyalar ilk dəfə olaraq M.Çobanovun yaradıcılığında geniş və sistemli şəkildə linqivistik tədqiqata cəlb olunub.

Köməkçi ad kateqoriyaları sisteminə daxil olan təxəllüslərin yaranma tarixi, izlənmə tezliyi, mənşəyi və arealını sistemli şəkildə araşdıran müəllif bu qənaətə gəlir ki, toponim, etnonim, zoonim, hidronim və kosmonimlər, həmçinin, ümumişlək sözlər əsasında düzələn təxəllüslər rəngarəng və maraqlı xüsusiyyətlərinə görə Azərbaycan mədəniyyətinin ən nadir inciləri hesab oluna bilər.

M.Çobanov ləqəblərin köməkçi ad kateqoriyaları sistemindəki yerini dəqiqləşdirməklə bərabər, onların fərdi-şəxsi, ailəvi-nəsli və məhəlli-kollektiv kimi növlərini də araşdırıb.

Antroponimlərin semantik qruplarına xüsusi diqqət yetirən M.Çobanov Azərbaycan antroponimlərinin məna qruplarını dəqiqləşdirərkən ən kiçik detalları belə nəzərdən qaçırmayıb. Müəllif toponim, etnonim, hidronim, zoonim və kosmonimlər, eyni zamanda silah adları əsasında düzələn antroponimləri geniş şəkildə təhlil etmişdir. Antroponimlərin semantikası ilə bağlı fikri təsdiq üçün bədii ədəbiyyat nümunələrinə istinad etmə, Mədəd Çobanovun tədqiqatlarında aparıcı mövqedədir. Qılınc, Kaman, Sadaq kimi atroponimləri "Kitabi -Dədə Qorqud" dastanındakı "Oğuz zamanında bir yigid ki, evlənsə ox atardı..." cümləsi və "sadağı tər, oxu tər" misrası ilə başlanan bayatı ilə əlaqələndirilib.

Türkologiyada ən az öyrənilən məsələlərdən biri də antroponimik hadisələrdir. Bu mövzu M.Çobanovun antroponimikaya dair əsərlərində təhlil süzgəcindən keçirilmiş, onların ən səciyyəvi cəhətləri dəqiqləşdirilmişdir. Müəllif antroponimik hadisələrin müştərək (ortaqlı), polinim, palindramik və abbreviatur kimi məna qruplarını konkret faktorlarla əsaslandırıb. Məsələn, müştərək antroponimlər (Həsrət, Şirin, İntizar...), polinim antroponimlər (Balaxanım-Xanbaba,Aygün-Günay...), abbreviatur antroponimlər (Q-əli-Qurbanəli, İ-Xəlil-İbrahimxəlil...)

M.Çobanovun *"Azərbaycan dilində antroponimik hadisələr"* məqaləsini (Azərbaycan onomastikası problemləri II. Azərbaycan onomastikası problemlərinə həsr olunmuş II elmi-nəzəri konfransın materialları (15-16 aprel 1988) // Bakı: APİ, 1988, s.96), həmçinin *"Azərbaycan antroponimiyasının əsasları"* kitabını yüksək qiymətləndirən Ə.Tanverdi onun "Azərbaycan dilində "gül" sözü əsasında 312 əsl şəxs adı düzəlmişdir" (səh.22) fikrinə əsaslanaraq, Azərbaycan antroponimik vahidlər sistemindəki antroponimlərin yarıdan çoxu milli adlardır - qənaətinə gəlmişdir. *(Tanrıverdi, Ə., 2012, səh.110-111)*

Antroponimlərin orfoqrayiası, poetik onomastika və s. kimi məsələlər də M.Çobanovun diqqətindən yayınmayıb. Belə ki, müəllif onların hər birini konkret fəsil və bölmələr üzrə sistemli şəkildə araşdırıb. Burada bircə faktı qeyd etmək kifayətdir ki, M.Çobanov antroponimlərin orfoqrafiyası ilə bağlı 39 maddə və 12 yarımmaddə müəyyənləşdirib. Bu da müəllifin dil hadisələrinə adi bir müşahidəçi kimi yox, zərgər dəqiqliyilə yanaşdığını təsdiqləyir.

M.Çobanov Azərbaycan antroponimlərini türk xalqları antroponimləri konteksində tədqiq edən alimlərimizdəndir. Məsələn, müəllif müştərək adlardan bəhs edərkən yazır: "...qazaxların antronimiyasında ənənə ilə bağlı olaraq yaranan adlara rast gəlmək olur. Adqoyma mərasimində ən çox qız olan ailələrdə oğlana qız adları qoyurlar. Məsələn: qıza Altay, Bolat, (Polad, Yanıl (Yonıl), Yanılxan, (Yanılxan) kimi adlar vermiş və onları oğlan kimi tərbiyə etmişlər..." Yaxud M.Çobanovun araşdırmalarından məlum olur ki, Bəxtiyar adı özbək, qırğız və qazax antroponikası baxımından da səciyyəvidir.

Bir sözlə, akademik Mədəd Çobanovun *"Azərbaycan antroponimiyasının əsasları"* adlı dərs vəsaiti ali məktəblərin filologiya fakültələrinin tələbələri ilə yanaşı, orta ixtisas və ümumtəhsil məktəblərinin Azərbaycan dili və ədəbiyyatı müəllimləri, həmçinin, magistrlər, doktorantlar və tədqiqatçılar üçün də qiymətli hədiyyədir.

Mədəd Çobanov *"Azərbaycan antroponimiyasının əsasları"* (1983) kitabının ilk nəşrindən sonra bir-birinin ardınca *"Mətnin linqvistik təhlili"* (Ali məktəb tələbələri və orta məktəb müəllimləri üçün dərs vəsaiti, Tbilisi, 1984, 1987), *"Azərbaycan dilinin tədrisi metodikasına dair"* (Orta məktəb müəllimləri üçün dərs vəsaiti, Tbilisi, 1986), *"Familiya. Təxəllüs"* (Tbilisi, 1987), *"Azərbaycan şəxs adlarının semantikası və orfoqrafiyası"* (Tbilisi, 1990) "Azərbaycan kişi adları" (Türkiyə, Ərzurum, 1993, 96 səh.) və s. adlı kitablarını oxucuların ixtiyarına vermişdir.

Həmin kitablar arasında *"Familiya. Təxəllüs"* (Tbilisi, 1987) və *"Azərbaycan şəxs adlarının semantikası və orfoqrafiyası"* (Tbilisi: "Qanatleba" 1990, 160 səh.) xüsusilə əhəmiyyətlidir. Gürcüstan Respublikası Xalq Təhsili Nazirliyi tərəfindən *"Orta məktəblərin Azərbaycan dili və ədəbiyyatı müəllimləri üçün vəsait"* kimi təsdiq olunmuş və 1990-cı ildə "Qanatleba" nəşriyyatı tərəfindən nəşr olunaraq oxucuların ixtiyarına verilmiş kitabın redaktoru: prof.Q.Kazımov, rəyçiləri: T.M.Əhmədov və prof.T.Əfəndiyevadır.
(http://web2.anl.az:81/read/page.php?bibid=vtls000069439)

Ə.Tanrıverdi daha sonra yazır: "M.Çobanovun 1987-ci ildə çap etdirdiyi *"Familiya. Təxəllüs"* kitabında ilk dəfə olaraq familiya və təxəllüslər geniş şəkildə tədqiqata cəlb olunmuşdur. Müəllif ad və ad sistemi, ata adı məsələlərini türkoloji istiqamətdə şərh etdikdən sonra familiyaların motivləşməsi məsələlərindən bəhs edir və Azərbaycan familiyalarının formalaşmasında üç prinsipin əsas olduğunu müəyyənləşdirir: kişi adı əsasında düzələn familiyalar, qadın adı əsasında düzələn familiyalar, kökü şəxs adı kimi işlənməyən sözlər əsasında düzələn familiyalar. Əsərdə təxəllüslərin mənşəyi, yaranma tarixi, işlənmə məqamları, mənaları, areal təxəllüslər, təxəllüs və onun avtonimlə üzvlənmə sistemi və s. kimi məsələlər izah olunmuş, 600-ə qədər təxəllüsü əhatə edən Azərbaycan təxəllüs lüğəti tərtib edilmişdir." *(Tanrıverdi, Ə., 2012, səh.28-29)*

Azərbaycan antroponimləri sistemində təxəllüslərin zənginliyi, dil müxtəlifliyi, məna və funksiyalarına görə köməkçi ad kateqoriyaları sistemində xüsusi yer tutduğunu, Azərbaycan təxəllüsləri sistemində ərəb və fars mənşəli apelyativlər əsasında formalaşan təxəllüslərin də mövcudluğunu qeyd edən Ə.Tanrıverdi öz tədqiqatlarında əsasən türk mənşəli apelyativ və onomastik vahidlər əsasında formalaşan təxəllüslərdən bəhs etdiyini qeyd etmiş və bildirmişdir ki, "Yeri gəlmişkən, tədqiqata cəlb etdiyimiz türk mənşəli təxəllüsləri M.Çobanovun *"Familiya, Təxəllüs"* kitabındakı "Təxəllüs lüğəti"ndən (səh. 67-91), bədii ədəbiyyat nümunələrindən və müxtəlif monoqrafiyalardan götürmüşük." *(Tanrıverdi, Ə., 2012, səh.143)*

"M.Çobanov ləqəblərin strukturu, leksik-semantik xüsusiyyətləri ilə yanaşı, fərdi-şəxsi ləqəb, ailəvi-nəsli ləqəb, məhəlli-kollektiv ləqəb məsələlərinə də münasibət bildirmişdir." *(Tanrıverdi, Əzizxan. səh.28-29)* – qənaətində olan professor Ə.Tanrıverdi çox haqqlı olaraq yazır ki, "professor M.Çobanovun onomastikaya dair tədqiqləri təkcə antroponimika ilə yekunlaşmır. Belə ki, müəllifin yaradıcılığında toponimik vahidlərin linqvistik prizmadan təhlili də xüsusi yer tutur. Mədəd Çobanovun toponimlərlə bağlı onlarca məqaləsi, həmçinin, Müşfiq Çobanlı (Borçalı – M.B.) ilə birlikdə çap etdirdiyi *"Borçalı toponimləri" (Bakı, 1996)* kitabı ziyalılara və geniş oxucu kütləsinə çoxdan tanışdır."

Dünya şöhrəti qazanmış görkəmli yazıçı, türkoloq Çingiz Aytmatov yazmışdır: "Tanınmış türkoloq Mədəd Çobanovun son illərdə onomastika sahəsində apardığı elmi tədqiqqatlar məni çox sevindirir. Xüsusilə də, toponimika sahəsində apardığı araşdırmalar çox qiymətli və təqdirəlayiqdir. Onun Ufada və Bişkekdə keçirilmiş beynəlxalq elmi konfranslardakı məruzələri isə diqqətimi xüsusilə cəlb etmişdir. Ona bu yolda uğurlar arzulayıram!" *(https://turan.info.az/gurcustan/6438-akademik-mdd-namaz-olu-obanovun-elmi-pedaqoji-faliyyti-haqqnda-hmkarlarnn-dediklrindn.html)*

Dünya şöhrətli akademik Edhem Rahimoviç Tenişyev (Moskva) isə yazmışdır: "Filologiya elminin tarixi ilə yaxından tanış olan professor M.N.Çobanov elmin müasir səviyyəsinə uyğun olan və araşdırılmamış mövzuları çox ustalıqla seçir və tədqiqata cəlb edir. Bu da onun elm sahəsində yeni-yeni nailiyyətlər qazanmasına səbəb olur". *(https://zim.az/gurcustan/6438-akademik-mdd-namaz-olu-obanovun-elmi-pedaqoji-faliyyti-haqqnda-hmkarlarnn-dediklrindn.html)*

"Professor M.N.Çobanov Azərbaycan dilçiliyi və Türkologiya sahəsində zəngin dilçilik ənənələrinə sadiq olmaqla yanaşı, Türkologiyanın müasir ümumi problemlərini araşdırıb, gələcək nəsillərə ötürülməsində böyük əməyi olan alimlər nəslinə mənsubdur..." – qənaətində olan akademik Şanazar Şaabduraxmanoviç Şaabduraxmanov (Özbəkistan) Mədəd müəllim haqqında öz fikirlərini belə yekunlaşdırmışdır: "Professor M.N.Çobanovun elmi yaradıcılığına dərindən nəzər saldıqda məlum olur ki, o, elmin keçmişi ilə müasirliyi, elmin müasirliyi ilə gələcəyini öz araşdırmalarında üzvi surətdə əlaqələndirməyə diqqət yetirən alimlərimizdən biridir. Başqa sözlə desək, alimin əsərlərində tarixiliyin müasirliyi... və ya müasirliyin tarixiliyi daim paralel halda araşdırmalara cəlb edilir". *(https://zim.az/gurcustan/6438-akademik-mdd-namaz-olu-obanovun-elmi-pedaqoji-faliyyti-haqqnda-hmkarlarnn-dediklrindn.html)*

Akademik Mədəd Çobanovun *"Borçalı toponimləri"* kitabında ilk dəfə olaraq *"Moksevai Kartlisa"* və *"İstorii Alvan"* kimi mənbələrə istinadən Gürcüstanda türk (Azərbaycan) köklü qəbilə və tayfaların məskunlaşma tarixi dəqiqləşdirilir, Borçalı bölgəsinin qədim türk yurdu olması inkaredilməz faktorlarla əsaslandırılır. *"Borçalı"* toponiminin *"qurdlar təpəsi"* mənasında olması da həmin müstəvidə izah edilir.

"Borçalı toponimləri" kitabının "Dədəm Qorqud dünyası ilə səsləşən Borçalı toponimləri" bölməsində Baydar, Bəytəkər, Sarvan, Ulaşlı, Qızlar bulağı kimi toponimik vahidlərin "Kitabi-Dədə Qorqud"dakı yer-yurd adları ilə səslənməsindən, qədim türk tarixi, dili və etnoqrafiyasının daha dərindən öyrənilməsində həmin vahidlərin xüsusi əhəmiyyət kəsb etməsindən bəhs edilir.

Həmin kitabda ilk dəfə olaraq Gürcüstandakı türk köklü oykonimlər tarixi onomastika prizmasından təhlilə cəlb edilir və onların 5 əsas qrupu dəqiqləşdirilir. Qədim oykonimlər, qədim və müasir oykonimlər, müasir oykonimlər, hibrid oykonimlər, təkrar və ya bir neçə variantlı oykonimlər. Bu qrupların hər biri konkret dil faktları ilə əsaslandırılıb.

Məsələn, Azərbaycan xalqının etnogenezində yaxından iştirak edən, türk mənşəli qəbilə və tayfa adları əsasında yaranan Aziki (Azlar), Qanlı, Qazan, Qıpçaq, Hunlar, Qaramanlı kimi vahidlər qədim oykonimlər sistemində tədqiq edilib.

Borçalı toponimlərinin semantikasını, xüsusən də semantik qruplarını sistemli şəkildə təhlilə cəlb edən də Mədəd Çobanovdur. Həmin bölmədə antroponimlər (Bəylər, Qasımlı, Səfərli...), etnotoponimlər (Quşçu, Ulaşlı, Türklər...), hidrotoponimlər (Qarabulaq, Qırxbulaq, Südbulaq...), zootoponimlər (Ayıtalası, Danaqıran, Leyləkuçan, Canavarlı...), fitotoponimlər (Armudlu, Qamışlı, Zoğallı, Vələsli, Palıdlı...), memuar-xatirə-toponimlər (Sabirkənd, Səməd Vurğun küçəsi, Nərimanov prospekti, Vazeh döngəsi...), kosmotoponimlər (Ayorta, Güney, Gündoğan...) sinxronik istiqamətlərdə təhlil edilir.

"Borçalı toponimləri haqqında qısa oçerklər" bəhs etdiyimiz kitabın ən əsas bölməsi hesab oluna bilər. Birincisi, ona görə ki, həmin bölmədə Orxan-Yenisey abidələri və "Kitabi-Dədə Qorqud" dastanı ilə səsləşən Azgəyliyən, Kaspi, Sadaqlı, Kəpənəkçi və s. kimi toponimlərin yaranma tarixi barədə geniş məlumat verilir. İkincisi, toponimik vahidlərin hər biri tarixi-linvistik prizmadan təhlil edildiyi üçün arxaik apelyativli toponimlərin səciyyəvi cəhətləri asanlıqla anlaşılır. Məsələn, Qarayazı, (böyük çöl), Qaracala (böyük çala,), Sadaqlı (Sadaq-ox qabı), Tüllər (tülü - tolu tayfa adı) və s.

"Bu cür faktlar isə "Borçalı toponimləri" kitabında onlarca toponimik vahidin etimoloji izahının verildiyini təsdiqləyir." – qənaətinə gələn müəllif - ADPU-nun Azərbaycan dilinin tədrisi metodikası kafedrasının müdiri, flologiya elmləri doktoru,

professor Əzizxan Tanriverdi *"Şərqin səsi"* (N: 03 (198), fevral, 2007) və *"Hakimiyyət və gələcək"* (N: 06 (146), 04 aprel, 2007) qəzetlərində dərc olunmuş "Mədəd Çobanov və onomalogiya məsələləri" məqaləsini belə bir sonluqla bitirmişdir: "Bu kiçik yazıda prof. Mədəd Çobanovun onomologiya ilə bağlı olan tədqiqatlarının az bir hissəsini, amma ən mühüm cəhətlərini əhatə etməyə çalışdım... Nəhayət, görkəmli dilçi-alim, tanınmış türkoloq, filologiya elmləri doktoru, professor Mədəd Çobanovu anadan olmasının 70 illik yubileyi münasibətilə ürəkdən təbrik edir və ona yeni-yeni yaradıcılıq uğurları arzulayıram." *(https://zim.az/gurcustan/pushkinciler/2389-mdd-obanov-v-onomalogya-msllr.html)*

Professor Əzizxan Tanriverdinin bu məqaləsindən sonra da, akademik Mədəd Çobanov təqaüdə çıxmasına baxmayaraq, ömrünün sonuna kimi elmi-pedaqoji fəaliyyətini davam etdirmiş, bir sıra elmi əsərlər yazmış, Azərbaycan Respublikası "Təhsil" Mərkəzininin Baş direktoru olmuş, müxtəlif mükafat komissiyalarının, qəzet və jurnalların redaksiya heyətlərinin üzvü seçilmiş, dəfələrlə Fəxri fərman, orden, medal və müxtəlif mükafatlarla təltif olunmuşdur.

Akademik Mədəd Çobanov 2021-ci ildə Prezident təqaüdünə layiq görülmüşdür.

1997-ci, 2007-ci, 2012-ci, 2017-ci və 2022-ci illərdə alimin 60, 70, 75, 80 və 85 illik yubileyləri Azərbaycanda və Gürcüstanda təntənəli surətdə qeyd olunmuş, haqqında kitablar yazılmış, məqalələr çap olunmuş, radio və televiziya verilişləri hazırlanmış, filmlər çəkilmişdir. O cümlədən, akademik Nizami Cəfərovun *"Zəhmətkeş alim, tanınmış dilçi-türkoloq"* adlı kitabı oxucuların ixtiyarına verilmişdir. *(Bakı: Az-AtaM, "Elm və təhsil" nəşriyyatı, 2012, 140 s. https://www.anl.az/el/c/Azf-266649.pdf)*

Akademik Mədəd Çobanov 2 iyun 2023-cü ildə 86 yaşında vəfat etmiş, iyunun 3-də Bakının Dədə Qorqud qəbiristanlığında dəfn olunmuşdur.

Akademik Mədəd Çobanov həm də gözəl ailə başçısı idi. Ömür-gün yoldaşı, tibb işçisi Rima Nadir qızı Əhmədova-Çobanova ilə birlikdə 5 övlad - 4 qız və 1 oğul böyüdüb-boya başa çatdırıb. Hamısı da ali təhsilli və ailəlidir. Oğlu və iki qızı alimdir. 9 nəvəsi, 18 nəticəsi var. Nəvələrinin də 9-u da ali təhsillidir.

Akademik Mədəd Çobanov dünyasını dəyişdikdən sonra da unudulmamış, Bakıda və Tbilisidə, eləcə də, Bolnisidə, Dmanisidə, Marneulidə, Qardabanidə və başqa bölgələrdə alimin ad və anım günləri qeyd olunmuş, onun əziz xatirəsinə neçə-neçə şeirlər, poemalar, esselər həsr olunmuş, müxtəlif tədbirlər, müsabiqələr, olimpiadalar, yarışlar və s. təşkil edilmiş, həyat və yaradıcılığı haqqında kitablar yazılmış, Azərbaycan və Gürcüstan mətbuatında silsilə məqalələr dərc olunmuş, Bakıda nəfis şəkildə çap olunaraq oxucular ixtiyarına verilmiş kitabların Azərbaycanda və Gürcüstanda təqdimatları keçirilmiş, həmin tədbirlər Azərbaycan və Gürcüstan mətbuatında, radio və televiziya verilişlərində, bir sıra internet saytlarında işıqlandırılmış və bütün bunlar Azərbaycan elminin inkişafını, həmçinin, Azərbaycan və gürcü xalqları arasındakı dostluq əlaqələrini daha da intensivləşdirmişdir.

Nəticə

Bir sözlə, akademik Mədəd Çobanovun yaradıcılığında Azərbaycan dili, Azərbaycanşünaslıq, türkologiya, türk ədəbi dillərinin birliyi, dilçilik, dialektologoiya, linqvistika, onomastika, xüsusilə də, antroponimika və toponimika, eləcə də, ədəbi tənqid və ədəbiyyatşünaslıq, ədəbi əlaqələr, o cümlədən, Azərbaycan və gürcü xalqlarının dostluq və qardaşlıq ənənələrinin ədəbi-bədii və elmi ədəbiyyatda təcəssümü və s. amillər yeni müstəviyə keçmiş, elmi təfəkkürdə öz geniş əksini tapmış, müəllifinin elmdə daha uzun ömür sürməsini təmin etmiş və beləliklə də, Azərbaycan dilçiliyi və Azərbaycan ədəbiyyatşünaslığı, ümumi olaraq, türkologiya və filologiya elmi, həmçinin, Azərbaycan-gürcü ədəbi əlaqələri daha da zənginləşmişdir.

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REFLECTION OF NATIONAL MENTALITY IN METAPHOR AND PAROEMIA

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ОТРАЖЕНИЕ НАЦИОНАЛЬНОГО МЕНТАЛИТЕТА В МЕТАФОРЕ И ПАРЕМИИ

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Abstract
In the modern anthropocentric linguistic paradigm, one of the central problems, which is why it is actively being developed, is the close relationship and interdependence of the national mentality and the national linguistic picture of the world, since language translates the worldview of an ethnic group through the prism of its cultural values. Metaphorical and paremiological units act as a repeater, along with other linguistic means, which is the object of consideration in this article.

Аннотация
В современной антропоцентрической лингвистической парадигме одной из центральных, потому активно разрабатываемых проблем является тесная взаимосвязь и взаимообусловленность национального менталитета и национальной языковой картины мира, поскольку посредством языка транслируется мировосприятие этноса сквозь призму его культурных ценностей. В качестве ретранслятора, наряду с другими языковыми средствами, выступают метафорические и паремиологические единицы, что и является объектом рассмотрения в данной статье.

Keywords: mentality, linguistic worldview, parody, metaphor, phraseology, national culture, language
Ключевые слова: менталитет, языковая картина мира, паремия, метафора, фразеология, национальная культура, язык

Одним из вызовов современности являются глобализационные процессы, формирующие как центростремительные, так и центробежные силы, заключающиеся стремлением к интеграции, с одной стороны, и стремлением к сохранению национальных культур. Соответственно изучение соотношения менталитета и языка приобретает особую актуальность в связи с угрозой унификации культур и нивелирования этнических различий.

Изучению менталитета и ментальности посвящено огромное количество литературы, в которой эти феномены изучаются с разных научных позиций: философской, культурологической, когнитивной, литературоведческой, психолингвистической, лингвокультурологической, менталингвистической и др. В лингвистике эта проблема рассматривается с точки зрения отражения ментальности в языке, в его грамматике, лексике, фразеологии и др.

Общеизвестно, что одной из сокровищниц любого языка являются образные средства, фразеология и паремия, через которые передаются архетипы и культурные сценарии, характеризующие своеобразие национального миропонимания. Как отмечал В.фон Гумбольдт, каждый язык выражает «особый способ видения мира» и создает вокруг народа «замкнутый круг», выйти за пределы которого можно лишь вступив в круг другого языка [1]. Эта мысль получила дальнейшее развитие в гипотезе лингвистической относительности Э.Сепира и Б.Уорфа, согласно которой структура языка определяет способ восприятия и категоризации мира [2]. Очевидно, что языковая картина мира является когнитивным пространством сохранения исторической памяти и духовной идентичности народа.

В русской культурной традиции эта связь осознавалась издавна. Уже в XIX веке мыслители и филологи (Н.М.Карамзин, К.С.Аксаков, В.И.Даль, А.А.Потебня) говорили о «духе языка» как о воплощении народного сознания. А.А.Потебня писал, что язык — это «орудие мышления» и «память человечества» [3].

В современной когнитивной парадигме этот тезис получает научное обоснование: язык рассматривается как ментально-культурный код, посредством которого человек осваивает мир. Такие утверждения, основанные на конкретных примерах, находим в работах В.В.Колесова, Т.Б.Рабдиля, З.Д.Поповой и И.А. Стернина, О.А.Корнилова и др.

Ключевым понятием в триаде Язык-Культура-Этнос является *менталитет.* Исследователи едины во мнении, что менталитет – сложный многоаспектный и многоструктурный феномен, аккумулирующий в себе совокупность установок, способов

мышления и эмоциональных реакций, закрепленных в сознании народа и проявляющихся в языке, поведении, культуре. Так, В. В. Колесов определяет ментальность как «миросозерцание в категориях и формах родного языка, соединяющее интеллектуальные, духовные и волевые качества национального характера» [4].

В поэтическом дискурсе О. Сулейменова метафора и фразеологически мотивированное выражение выступают ключевыми средствами концептуализации исторического опыта, пространства степи и коллективной памяти. Поэтический дар О.Сулейменова, как правило, проявляется также в предпочтении индивидуально-авторской трансформации общеязыковых фразеологизмов и создании новых образных конструкций, восходящих к устойчивым моделям национального и общеязыкового сознания. Благодаря этой контаминации им формируется особый тип поэтической фразеологизации и метафоризации. В них динамика движения, труд, родовая память и природная стихия осмысливаются через телесные, звуковые и пространственные метафоры. Эти образы, будучи глубоко укоренёнными в кочевой картине мира, легко соотносятся с казахской языковой традицией, что подтверждает их межкультурный и архетипический характер. В качестве подтверждения приведем несколько примеров из разных произведений поэта.

Таблица-1.

Метафоры в поэзии О. Сулейменова

Название произведения	Метафора из текста О. Сулейменов	Значение	Казахский аналог
«Ришад, сын степняка»	«В моих жилах грохочет холод»	Родовая память, внутренняя стихия	Жанымда суық дүбірлейді
«Хлебная ночь»	«Желтые горы зерна»	Урожай как ландшафт	Сары астық таулары
«Хлебная ночь»	«Тяжелый пшеничный дождь»	Зерно как природная стихия	Қалың бидай жаңбыры
«Бетпак-Дала…»	«Пустыня взбешена»	Враждебная активная природа	Ашуланған шөл
«Хлебная ночь»	«Степь развернулась без края»	Бесконечность пространства и судьбы	Шексіз дала жайылды

Характерной является метафора *в моих жилах грохочет холод* («Ришад, сын степняка»), в которой телесный код соединяется с природно-стихийным. Холод здесь не просто физическое состояние, а форма родовой памяти и степной закалки, «звучащей» внутри человека. В казахской языковой картине мира данное значение соотносится с выражением *жанымда суық дүбірлейді*, где внутреннее состояние также осмысляется как динамическое и акустически маркированное.

Не менее значима метафора *желтые горы зерна* («Хлебная ночь»), в которой результат человеческого труда уподобляется природному рельефу. Урожай предстает как новый ландшафт, созданный усилиями человека, что коррелирует с казахским образом *сары астық таулары*. В этом контексте труд осмысливается как продолжение природного бытия, а не противопоставление ему.

Развивая данную линию, поэт использует образ *тяжелого пшеничного дождя*, где зерно метафорически включается в ряд природных стихий. Такой перенос подчеркивает сакрализацию хлеба как основы жизни. В казахском языке аналогичное значение передается сочетанием *қалың бидай жаңбыры*, также фиксирующим идею изобилия и плодородия.

В стихотворении «Бетпак-Дала…» степь наделяется активным, почти враждебным характером через метафору *пустыня взбешена*. Олицетворение пространства отражает экзистенциальное напряжение взаимодействия человека и природы, где среда не пассивна, а испытывает и отбирает. Близкий по смыслу казахский образ — *ашуланған шөл* — укоренён в традиционном представлении о степи как силе, требующей выносливости.

Наконец, метафора *степь развернулась без края* формирует представление о пространстве как о судьбе, не имеющей границ и конечной точки. Здесь степь становится моделью жизненного пути, что соотносится с казахским образом *шексіз дала жайылды*, устойчиво закреплённым в национальной поэтической традиции.

Наряду с метафорами в поэзии О. Сулейменова функционируют фразеологизмы и фразеологически мотивированные выражения, подобные приведенным ниже языковым единицам (см. Табл.2).

Таблица-2.

Фразеологизмы и фразеологически мотивированные выражения

Название произведения	ФЕ из текста О. Сулейменов	Значение	Казахский аналог
«Хлебная ночь»	«Живущий без выходных»	Непрерывный, изнурительный труд	Демалыссыз еңбек ету
«Хлебная ночь»	«Хоть в ухо ему кричи»	Полная неотзывчивость	Құлағына айқайласаң да естімейді
«Бетпак-Дала…»	«От порога до порога»	Полнота пространства	Босағадан босағаға дейін
«Бетпак-Дала…»	«Жилы играют»	Внутренний подъём, напряжение	Жаны тасып тұр
«Бетпак-Дала…»	«В стремя — хоп!»	Мгновенность действия	Үзеңгіге қарғып міну

Рассмотрим приведенные в таблице ФЕ и фразеологически мотивированные выражения. Так, оборот *живущий без выходных* («Хлебная ночь») представляет собой общеязыковой фразеологизм, актуализирующий идею непрерывного, изнурительного труда, что в казахском языке передается сочетанием *демалыссыз еңбек ету*.

Разговорное выражение *хоть в ухо ему кричи* используется для характеристики предельной сосредоточенности и усталости человека, полностью поглощённого работой. Его семантика легко сопоставляется с казахским оборотом *құлағына айқайласаң да естімейді*, также обозначающим полную неотзывчивость.

Фразеологизированное сочетание «от порога до порога» («Бетпак-Дала…») служит средством обозначения пространственной полноты и замкнутости, что находит прямой аналог в казахском выражении "босағадан босағаға" дейін.

Выражение *жилы играют* в контексте поэтики О.Сулейменова приобретает значение внутреннего подъема и физической готовности к действию. В казахской языковой традиции данное состояние передается через сочетание *жаны тасып тұр*, где эмоциональная энергия также описывается как избыточная и движущая.

Наконец, экспрессивная формула *в стремя — хоп*! репрезентирует мгновенность и решительность действия, восходя к кочевому опыту. Ее семантическим аналогом в казахском языке является выражение *үзеңгіге қарғып міну*, в котором скорость и ловкость также выступают ценностными характеристиками.

Проведённый анализ подтверждает, что метафорические и паремиологические единицы выступают важнейшими репрезентантами национального менталитета и ключевыми элементами языковой картины мира. Язык в данном аспекте функционирует не только как средство коммуникации, но и как механизм сохранения и трансляции коллективной памяти, культурных архетипов и ценностных установок этноса. Метафора и фразеология аккумулируют исторический опыт народа, отражая специфику его мировосприятия, способы концептуализации пространства, труда, природы и человеческого бытия.

Анализ поэтического дискурса О. Сулейменова показал, что индивидуально-авторские метафоры и фразеологически мотивированные выражения опираются на глубинные модели национального сознания и демонстрируют устойчивую корреляцию с казахской языковой традицией. Это свидетельствует о межкультурном и архетипическом характере образов, в которых кочевая картина мира, идея движения, степного пространства и родовой памяти находят художественное переосмысление. Тем самым метафора и паремия подтверждают свою роль как когнитивно-культурного кода, обеспечивающего преемственность национального менталитета в условиях современных глобализационных процессов и сохраняющего уникальность этнического мировидения.

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